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A Survey of the Fishes Utilizing the Major Streams Flowing into Dauphin Lake, Manitoba, 1982

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A SURVEY OF THE FISHES UTILIZING THE MAJOR STREAMS FLOWING INTO DAUPHIN LAKE, MANITOBA, 1982

by

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ABSTRACT

Harbicht, S.M., and W.G. Franzin. 1988. A survey of the fishes utilizing the major streams flowing into Dauphin Lake, Manitoba, 1982. Can. Manuscr. Rep. Fish. Aquat. Sci. 1974: iv + 72 p.

A fisheries baseline survey was conducted, during the open water season of 1982, on major streams flowing into and out of Dauphin Lake, Manitoba. The spring migration of spawning fish associated with each stream contained, in reasonable numbers, the following species; northern pike (Esox lucius), white sucker (Catostomus commersoni), shorthead redhorse (Moxostoma macrolepidotum), quillback (Carpiodes cyprinus) and to a much lesser extent walleye (Stizostedion vitreum), sauger (Stizostedion canadense), perch (Perca flavescens), goldeye (Hiodon alosoides), carp (Cyprinus carpio) and silver redhorse (Moxostoma anisurum). Enumeration, wet weights, fork lengths, age frequency, and length frequency for each spawning species migrating up each stream was determined. Resident stream fish communities were assessed throughout the summer along the accessible reaches of these streams, providing an inventory of resident species. This survey provided specimens documenting the extension of the ranges of Notropis heterodon, Hybognathus hankinsoni, Phoxinus eos, and P. noegaeus, in Manitoba. The information accumulated in this survey will provide a basis from which the Dauphin lake rehabilitation project can determine some of its future research objectives.

Key words: northern pike; white sucker; shorthead redhorse; quillback; walleye; sauger; perch; goldeye; carp; silver redhorse; spawning, rivers; range extensions.

RÉSUMÉ

Harbicht, S.M., and W.G. Franzin. 1988. A survey of the fishes utilizing the major streams flowing into Dauphin Lake, Manitoba, 1982. Can.Manuscr. Rep. Fish. Aquat. Sci. 1974: iv + 72 p.

Une campagne en vue de recueillir des données de base sur la population de poisson a été effectuée, au cours de la période d'eau libre de 1982, dans les principaux cours d'eau qui partent du lac Dauphin et qui s'y déversent. Il se trouvait pour chaque cours d'eau, en nombre raisonnable, parmi les poissons qui remontaient au printemps pour aller frayer, des grands brochets (Esox lucius), des meuniers noirs (Catostomus commersoni), des suceurs rouges (Moxostoma macrolepidotum), des couettes (Carpiodes cyprinus) et, dans une moindre mesure, des dorés (Stizostedion vitreum), des dorés noirs (Stizostedion canadense), des perchaudes (Perca flavescens), des laquaiches (Hiodon alosoides), des carpes ordinaires (Cyprinus carpio), et des suceurs blancs (Moxostoma anisurum). Pour chaque espèce de poisson qui remontait un cours d'eau pour aller frayer, on a fait un dénombrement des sujets, on a consigné leur poids au sortir de l'eau, leur longueur à la fourche et la distribution de fréquence d'âge et de longueur. Les populations sédentaires de poisson ont été évaluées pendant tout l'été le long des parties accessibles de ces cours d'eau, ce qui a permis d'en faire la liste. L'étude a permis de recueillir des spécimens qui attestent l'extension de l'aire de distribution du Notropis heterodon, du Hybognathus hankinsoni, du Phoxinus eos et du P. noegaeus au Manitoba. Les données recueillies au cours de cette étude serviront de base pour déterminer un certain nombre d'objectifs futurs de recherche dans le cadre du projet de revalorisation du lac Dauphin.

Mots-clés: grand brochet; meunier noir; suceur rouge; couette; doré; doré noir; perchaude; laquaiche; carpe ordinaire; suceur blanc; frai, en rivières; extension de l'aire de distribution.

INTRODUCTION

The Department of Fisheries and Oceans, in cooperation with the Manitoba Department of Natural Resources, has undertaken a fisheries rehabilitation research project at Dauphin Lake, Manitoba. The objective of this research project is to develop hydrological and ecological techniques to aid the rehabilitation of the freshwater fisheries of Central Canada.

Dauphin Lake, Manitoba (51°17'N, 99°48'W) was selected (Fig. 1) for a fisheries rehabilitation study because this lake historically supported a very productive commercial walleye fishery. W. Howard (pers. comm.) showed that the ten year average annual catch of 56 031 kg (123 270 lb) of walleye during the 1930's had dropped to 4 427 kg (9 740 lb) in the sixties. Babaluk et al. (1984) showed that walleye production has continued at a low level into the seventies and eighties.

One phase of the project involved the collection of fisheries baseline data from the inflowing streams of Dauphin Lake. Eight inflowing streams and the outlet stream were sampled for all species of fish during the open water period of 1982. Information collected included species present as permament residents or as migrants, timing and duration of spawning runs, relative abundance, number of species using the streams and biological information about each spawning species.

METHODS AND MATERIALS

STUDY AREA

Dauphin Lake has a total drainage area of approximately 8 936 km^2 which can be divided into seven tributaries drainages. These are: Valley River (3 048 km^2), Turtle River (1 784 km^2), Wilson River (950 km^2, Vermilion River (748 km^2), Ochre River (427 km^2), Edwards Creek (310 km^2) and Mink Creek (269 km^2). Other smaller creeks which discharge to Dauphin Lake are Mowat Creek, Crooked Creek, Kerosene Drain, Bennet Drain, and Crawford Creek. Most of the streams originate in the Riding and Duck Mountains located west of Dauphin Lake (Fig. 2). Mossy River, the only outlet from Dauphin Lake, flows northward into Lake Winnipegosis.

The following streams were sampled: Mossy River, Mink Creek, Vermilion River, Wilson River, Edwards Creek, Crooked Creek, Ochre River, Turtle River, Crawford Creek, Bennet Drain and several smaller tributaries which flow into the above mentioned streams. Manitoba Department of Natural Resources staff conducted a detailed fisheries study on the Valley River during the years 1982 and 1983. That study is summarized by Gaboury (1985).

FISHING

Sampling of the larger species of fish that were spawning in the inflowing streams to Dauphin Lake took place during the period April 26 to May 31, 1982. The fish were captured by using the following gear; 0.9 meter (three foot) hoop nets in Crooked and Edwards Creeks, 1.5 meter (five foot) hoop nets in Wilson, Vermilion, Ochre and Mossy rivers, 3.0 meter (10 foot) pound net in Turtle River, 1.5 meter (five foot) box trap in Mink River and a .6 meter (two foot) box trap in Bennet Drain. These nets were positioned in the stream (Fig. 2) to monitor upstream movement only. The leads extended partially across the stream capturing only a small percentage of the fish in the run (with the exception of Crooked creek where the nets extended across the full width of the stream). The nets were placed in each stream as soon as the water levels would permit and far enough upstream from the mouth of the stream to ensure that the fish were truly committed to the stream.

SAMPLING

All fish caught were identified to species, counted, sexed if possible, measured (fork length) and sub-sampled for weight and structures for age determination, and then released back to the system. Fish ages were determined by microscopic examination of structures as follows: scales; northern pike (Esox lucius), thin sections of the first four rays of pectoral fins: white sucker (Catostomus commersoni, shorthead redhorse (Moxostoma macrolepidotum), silver redhorse (Moxostoma anisurum), carp (Cyprinus carpio), quillback (Carpiodes cyprinus), and goldeye (Hiodon alosoides); thin sections of the first and second dorsal spines: walleye (Stizostedion vitreum vitreum), sauger (Stizostedion canadense), and perch (Perca flavescens). All captured walleye were tagged with individually-numbered Floy anchor tags prior to release.

Water temperatures were recorded at the trap sites using either a hand held thermometer or a Ryan continuously recording submersible thermistor.

The upstream reaches of the streams were sampled periodically throughout the summer to determine the resident fish species. The following streams were sampled on a regular basis: Vermilion River, Mink Creek, Wilson River, Edwards Creek, Ochre River, Crawford Creek, and Turtle River. Valley River, Mossy River, Crooked Creek, Ranch Creek, Browns Creek, Rennicker Creek and Renfrew Creek were sampled less frequently during the summer. Depending on the condition of the stream, either a Coffelt BP4 electroshocker or a small, fine mesh seine was used to sample the fish. Specimens caught were preserved for later identification. The locations of these sites are shown in Fig. 2.

RESULTS AND DISCUSSION

STREAM FLOW

An evaluation of the discharge levels from five streams flowing into Dauphin Lake during the sampling period (April 26 - May 31, 1982) was conducted using information obtained from

the Manitoba Historical Streamflow Summary 1982 (Environment Canada 1983). A comparison between mean monthly discharge for April, May, June of 1982 and the same period of time for the previous 10 and 20 year intervals (Table 1) showed that with 95% confidence 60% and 66% of the means of monthly discharge were below the 10 and 20 year averages respectively. This indicates that in most cases stream flow was below average during the period of study.

WATER TEMPERATURE

Water temperature of all of the inflowing streams increased at about the same rate during the sample period (Appendix 1). However, Mink Creek, Wilson River, Crooked Creek and Bennet Drain warmed more quickly shortly after ice out when compared to the other streams. This probably was due to a low input of melt-water from higher elevations and a high input of agricultural runoff. Mink Creek may be an exception as it receives a high volume of melt-water from the Duck Mountains, but the water must move through an extensive marsh system before it reaches the recording site. Thus, increased solar heating may have caused the higher water temperatures. By the first week of May, all streams were similar in water temperature patterns with the exception of Mossy River. As the Mossy River is the outlet of Dauphin Lake its temperature pattern is a reflection of lake water temperature.

MIGRATING FISH SPECIES

Eleven major species of fish utilized the inflowing streams of Dauphin Lake. Ten species were involved in spring spawning while one (burbot) probably was an incidental capture. Table 2 gives the numbers of each species captured from each stream sampled; Figure 3 is a graphic representation of these data. Northern pike, white sucker, quillback and shorthead redhorse were, in order of abundance, the most common larger fish utilizing the river for spawning purposes. The remaining migrating species were relatively low in numbers.

NORTHERN PIKE

Northern pike was the first species to enter the streams beginning during, or immediately after, the period of ice discharge. The numbers of northern pike caught however do not reflect the true numbers utilizing the streams because they were migrating upstream well before it was possible to install capturing nets. All nine streams sampled contained northern pike with Turtle River having the highest number. A summary of information on the composition of northern pike spawning runs is given in Table 2, (for details see Appendix 2). The female to male sex ratio for all runs combined was 1:1.11. Means of fork length and age for combined samples were 472.6 mm and 6.9 y respectively for males and 497.1 mm and 7.3 y respectively for females. The length-frequency distributions for northern pike of each stream are shown in Fig. 4; G,H, I,J,K,L,M,N,O. The ranges in fork length (all runs combined) for females and males were 275 mm to 1000 mm and 291 mm to 990 mm respectively. Northern pike had a modal age of seven years in all rivers except Mossy and Mink River where it was eight years (Fig. 5; A,B,C,D,E,F,G,H). Age ranged from 3 to 14 y for females and 3 to 12 y for males. Water temperature ranged from 3°C to 22°C during the period in which northern pike were captured.

WALLEYE

Walleye began spawning migrations when water temperatures reached 6°C and continued at temperatures up to 19.9°C. Walleye were found in six streams but not in great numbers. Ochre river yielded the highest catch (N = 60). The sex ratio of females to males for all streams was 1:4.78. Means of fork length and age were 433.0 mm and 5.5 y respectively for males and 457.3 mm and 7.5 y respectively for females in the combined sample. Length-frequency distributions for walleye are shown for Ochre River (Fig. 4,F) the only stream from which there were sufficient numbers to plot. The ranges in fork length for Ochre River males and females were 355 to 552 mm and 349 to 560 mm respectively. These fish ranged in age from 5 to 8 y for females and 3 to 12 y for males. The modal age of walleye from Ochre River was 4 y (Fig. 5; X).

WHITE SUCKERS

White suckers were found in all streams with the greatest numbers occurring in Mink River, Mossy River, Crooked Creek and Ochre River. The sex ratio of females to males in the combined sample was 1:0.82. Means of fork length and age in the combined sample were 396.2 mm and 9.1 y respectively for males and 431.2 mm and 9.4 y respectively for females. Length-frequency distributions for white sucker for each stream are shown in Fig. 4; P,Q,R,S,T,U, V,W,X. Ranges in fork lengths for males and females (all streams combined) were 264 to 498 mm and 331 to 512 mm respectively. The age range for females was 4 to 16 y and for males 3 to 18 y. Modal ages of white sucker (Fig. 5; I,J,K,L,M,N,O,P,Q) ranged from 7 to 12 y among the streams sampled. Spawning runs began when water temperatures reached 3°C and continued at temperatures up to 21.1°C.

QUILLBACK

Quillback were found in five of the streams; Wilson River, Vermilion River, Edwards Creek, Ochre River and Turtle River. The sex ratio of the combined sample, female to male, was 1:0.86. Means of fork length and age for the combined sample were 406.8 mm and 11.3 y for males respectively, and for females, 433.1 mm and 11.3 y respectively. Length-frequency distributions for quillback are shown for three streams in Fig. 4; A,B,C. Fork lengths for males and females (all streams combined) ranged from 284 to 555 mm and 225 to 532 mm respectively. Age ranged from 3 to 19 y for females and 4 to 16 y for males. Age-frequency distributions from four streams are shown in Fig. 5; T,U,V, W. Spawning runs began when water temperatures

reached 6°C and continued at temperatures up to 22°C.

SHORTHEAD REDHORSE

Shorthead redhorses were found in all streams except Crooked Creek and Bennet Drain. The sex ratio for the combined sample, female to male was 1:0.97. Means of fork length and age (combined samples) were 354.1 mm and 8.5 y respectively for males and 371.2 mm mm and 8.2 y respectively for females. Length-frequency distributions for shorthead redhorse from Ochre River and Wilson River are shown in Fig. 4; D,E. Fork lengths (all streams combined) for males ranged from 320 to 416 mm and for females, 316 to 454 mm. Ages of shorthead redhorse ranged from 6 to 13 y for females and 7 to 15 y for males. Age-frequency distributions for shorthead redhorse from Ochre River and Wilson River are shown in Fig. 5; R,S. Spawning runs began when water temperatures reached 4°C and continued at temperatures up to 21°C.

OTHER SPECIES

The remaining species, including silver redhorse, goldeye, burbot, yellow perch, and carp, were caught in small numbers. Data on these species (all streams combined) are shown in Table 3.

RESIDENT STREAM FISH

The presence or absence of fish species as determined by electroshocking and seining in the streams during the summer of 1982 is shown in Table 4. The qualitative sampling technique employed precluded statistical comparisons between sites or between streams. We believe that we have sampled the majority of species present although not in terms of relative abundance. There is also a remote possibility that rare species may have been missed. Table 5 provides the numbers of each species collected at each station on Dauphin Lake tributary and outlet streams during summer, 1982.

All of the major tributaries to Dauphin Lake had a good diversity of resident species of small fish, mainly cyprinids. Smaller streams such as Browns, Ranch, Rennicker, and Renfrew creeks, first order streams that flow intermittently into Wilson River, contained lower numbers of resident species. Crooked Creek also yielded low numbers of resident species, probably due to its intermittent flows and very reduced drainage area.

The most common resident species found in all streams, in descending order of abundance, were Notropis cornutus, Rhinichthys atratulus, Semotilus atromaculata, Etheostoma nigrum, Rhinichthys cataractae, Semotilus margarita, Notropis atherinoides, Hybognathus hankinsoni and Notropis hudsonius. Catostomus commersoni was found at most sites in most streams and, judging from the size and age of the larger specimens, stunted resident populations may occur in some streams. Several age classes of Esox lucius, Carpiodes cyprinus and Moxostomus macrolepidotum were present in some streams but they probably migrate out of the streams before freeze up.

CONCLUSIONS

This study presents preliminary baseline information on fish species which make use of the tributary streams of Dauphin Lake for spawning, and qualitative information on the resident fish populations of the streams. Little of this information was available prior to this study; it provides therefore, a reference point from which future work may be evaluated. The study also has provided specimens documenting the extension of the ranges of several minnow species in Manitoba such as; Notropis heterodon (Babaluk and Harbicht 1983) and Hybognathus hankinsoni, Phoxinus eos, and P. neogaeus (Harbicht et al. 1988). Also, the data herein will assist in the development of a practical fisheries rehabilitation scheme for Dauphin Lake.

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Table 1. Comparison of the mean discharge for April, May and June, 1982 with means discharge for those months in the 10 and 20 y intervals prior to 1982.

			APRIL (AVERAGE DISCHARGE M^3/SEC)			MAY (AVERAGE DISCHARGE M^3/SEC)			JUNE (AVERAGE DISCHARGE M^3/SEC)		
STREAM	INTERVAL	N	MEAN	SD	95% C.I.	MEAN	S.D.	95% C.I.	MEAN	S.D.	95% C.I.
MINK CREEK	1972 - 1981	10	1.182	0.955	(0.483 - 1.881)	0.743	0.912	(0.060 - 1.426)	0.691	1.328	(-0.133 - 1.515)
	1962 - 1981	20	1.019	0.789	(0.603 - 1.435)	0.655	0.736	(0.253 - 1.057)	0.475	0.951	(0.019 - 0.931)
	1982		0.517		(*,##)	0.135		(*,**)	0.055		(*,**)
WILSON RIVER	1971 - 1981	10	12.296	10.893	(9.935 - 14.657)	4.412	8.573	(2.318 - 6.506)	2.716	3.857	(1.311 - 4.121)
	1961 - 1981	20	11.552	8.943	(10.152 - 12.952)	4.566	7.273	(3.304 - 5.828)	1.940	2.873	(1.147 - 2.733)
	1982		6.080		(*,**)	0.756		(#,##)	0.138		(#,##)
VERMILION RIVER	1971 - 1981	10	10.461	9.129	(8.300 - 12.622)	6.194	8.338	(4.129 - 8.229)	2.441	3.156	(1.140 - 3.682)
	1961 - 1981	20	8.914	6.772	(7.696 - 10.132)	5.775	6.972	(4.539 - 7.011)	2.384	2.608	(1.628 - 3.140)
	1982		7.380		(#,##)	1.700		(#,##)	0.338		(#,##)
OCHRE RIVER	1971 - 1981	10	5.267	4.010	(3.835 - 6.699)	4.838	5.348	(3.184 - 6.492)	2.531	2.463	(1.408 - 3.654)
	1961 - 1981	20	4.749	3.143	(3.919 - 5.579)	5.453	5.307	(4.375 - 6.531)	3.173	3.247	(2.33 - 4.016)
	1982		5.510		(*,**)	2.180		(#,##)	0.705		(#,##)
TURTLE RIVER	1971 - 1981	10	13.006	11.972	(10.531 - 15.481)	6.751	7.599	(4.779 - 8.678)	2.766	1.877	(1.786 - 3.746)
	1961 - 1981	20	10.793	8.939	(9.394 - 12.192)	6.561	6.508	(5.367 - 7.755)	3.568	3.460	(2.697 - 4.439)
	1982		10.300		(*,**)	3.870		(#,##)	0.973		(#,##)

* - value lies within the 95% C.I. of the mean for the last ten years
** - value lies within the 95% C.I. of the mean for the last twenty years
# - value is less then the 95% C.I. of the mean for the last ten years
- value is less then the 95% C.I. of the mean for the last twenty years

Table 2. Summary of trap, hoop and box trap catches, range of water temperature and timing of spawning runs of Dauphin Lake tributary and outlet streams, 1982.

SPECIES	LOCATION	TIMING OF SPAWNING RUN	WATER TEMP (°C)				FORK LENGTH (MM)				TOTAL
		1982	MIN	MAX			N	MEAN	MIN	MAX	COUNTED
WALLEYE	CROOKED CREEK	APR 23 - APR 28	6.0	15.0	*	TOTAL SAMPLED	13	451.5	386.0	523.0	13
						MALES	11	442.6	386.0	523.0	
						FEMALES	2	500.0	492.0	508.0	
WALLEYE	OCHRE RIVER	APR 30 - MAY 12	8.5	19.9	*	TOTAL SAMPLED	60	453.7	358.0	630.0	60
						MALES	22	436.7	380.0	529.0	
						FEMALES	4	516.0	488.0	538.0	
WALLEYE	TURTLE RIVER	APR 29 - MAY 07	6.0	14.0	*	TOTAL SAMPLED	2	482.0	412.0	552.0	2
						MALES	2	482.0	412.0	552.0	
						FEMALES	0	0.0	0.0	0.0	
WALLEYE	WILSON RIVER	APR 29 - MAY 04	9.0	15.0	*	TOTAL SAMPLED	3	407.0	402.0	414.0	3
						MALES	3	407.0	402.0	414.0	
						FEMALES	0	0.0	0.0	0.0	
WALLEYE	VERMILION RIVER	16-MAY-82	14.0		*	TOTAL SAMPLED	1	380.0			1
						MALES	1	380.0			
						FEMALES	0				
WALLEYE	MINK RIVER	APR 24 - MAY 01	7.0	12.0	**	TOTAL SAMPLED	7	438.1	349.0	560.0	7
						MALES	4	403.3	355.0	438.0	
						FEMALES	3	484.7	349.0	560.0	
NORTHERN PIKE	EDWARDS CREEK	APR 26 - MAY 28	3.0	19.0	**	TOTAL SAMPLED	2035	467.9	292.0	917.0	2052
						MALES	1117	456.5	292.0	880.0	
						FEMALES	904	481.9	355.0	917.0	
NORTHERN PIKE	CROOKED CREEK	APR 23 - MAY 15	6.0	19.2	*	TOTAL SAMPLED	1115	491.6	322.0	935.0	1120
						MALES	459	470.5	322.0	670.0	
						FEMALES	644	506.5	340.0	935.0	
NORTHERN PIKE	OCHRE RIVER	APR 30 - MAY 31	8.5	22.3	***	TOTAL SAMPLED	273	482.8	340.0	700.0	274
						MALES	100	466.3	340.0	582.0	
						FEMALES	159	490.4	354.0	700.0	
NORTHERN PIKE	TURTLE RIVER	APR 21 - MAY 25	5.6	16.0	*	TOTAL SAMPLED	2030	490.7	346.0	974.0	17551
						MALES	1073	484.0	346.0	623.0	
						FEMALES	932	498.2	351.0	974.0	
NORTHERN PIKE	MOSSY RIVER	APR 26 - MAY 18	4.0	14.0	**	TOTAL SAMPLED	463	476.7	262.0	638.0	524
						MALES	275	466.9	344.0	594.0	
						FEMALES	175	492.9	375.0	638.0	
NORTHERN PIKE	MINK CREEK	APR 22 - MAY 16	7.0	16.0	**	TOTAL SAMPLED	304	470.5	250.0	750.0	308
						MALES	156	459.4	351.0	569.0	
						FEMALES	146	483.9	380.0	750.0	
NORTHERN PIKE	WILSON RIVER	APR 25 - MAY 19	6.5	15.0	***	TOTAL SAMPLED	1222	495.6	260.0	1000.0	1457
						MALES	654	476.9	291.0	990.0	
						FEMALES	564	516.3	275.0	1000.0	
NORTHERN PIKE	VERMILION RIVER	APR 26 - MAY 20	4.0	14.0	***	TOTAL SAMPLED	1150	490.3	305.0	985.0	4112
						MALES	643	482.5	305.0	698.0	
						FEMALES	505	500.4	350.0	985.0	
NORTHERN PIKE	BENNET DRAIN	APR 04 - MAY 14	6.0	21.0	**	TOTAL SAMPLED	26	452.3	343.0	525.0	26
						MALES	6	439.8	343.0	525.0	

Table 2. Continued.

SPECIES	LOCATION	TIMING OF SPAWNING RUN	WATER TEMP (°C)					FORK LENGTH (MM)				TOTAL COUNTED
		1982	MIN	MAX				N	MEAN	MIN	MAX	
WHITE SUCKER	EDWARDS CREEK	APR 26 - MAY 28	3.0	19.0	**	TOTAL	SAMPLED	224	409	335	487	224
							MALES	105	394.2	335.0	487.0	
							FEMALES	119	422.0	364.0	473.0	
WHITE SUCKER	CROOKED CREEK	APR 23 - MAY 15	6.0	19.2	*	TOTAL	SAMPLED	544	422.5	335.0	499.0	545
							MALES	200	403.7	335.0	498.0	
							FEMALES	343	433.5	363.0	499.0	
WHITE SUCKER	OCHRE RIVER	APR 25 - MAY 24	8.5	21.1	***	TOTAL	SAMPLED	709	410.9	297.0	499.0	709
							MALES	334	394.9	297.0	478.0	
							FEMALES	369	425.4	353.0	499.0	
WHITE SUCKER	TURTLE RIVER	APR 04 - MAY 20	5.6	14.3	*	TOTAL	SAMPLED	206	418.8	350.0	478.0	206
							MALES	62	397.2	350.0	465.0	
							FEMALES	144	428.0	376.0	478.0	
WHITE SUCKER	MOSSY RIVER	APR 26 - MAY 18	4.0	14.0	**	TOTAL	SAMPLED	758	406.6	264.0	498.0	1395
							MALES	370	386.2	264.0	498.0	
							FEMALES	364	427.5	354.0	475.0	
WHITE SUCKER	MINK CREEK	APR 23 - MAY 16	7.0	16.0	**	TOTAL	SAMPLED	1059	417.5	288.0	494.0	3489
							MALES	525	399.3	331.0	494.0	
							FEMALES	532	435.7	331.0	494.0	
WHITE SUCKER	WILSON RIVER	APR 25 - MAY 15	6.5	15.0	***	TOTAL	SAMPLED	190	432.5	330.0	512.0	190
							MALES	64	410.3	330.0	484.0	
							FEMALES	126	443.7	368.0	512.0	
WHITE SUCKER	VERMILION RIVER	APR 26 - MAY 20	4.0	16.1	***	TOTAL	SAMPLED	70	429.2	335.0	486.0	70
							MALES	21	408.5	355.0	438.0	
							FEMALES	49	438.1	335.0	486.0	
SHORTHEAD REDHORSE	MOSSY RIVER	MAY 01 - MAY 08	4.0	8.0	**	TOTAL	SAMPLED	3	294.7	230.0	330.0	4
							MALES					
							FEMALES					
SHORTHEAD REDHORSE	MINK CREEK	APR 24 - APR 13	7.0	16.0	**	TOTAL	SAMPLED	9	362.1	303.0	436.0	9
							MALES					
							FEMALES	4	366.8	330.0	430.0	
SHORTHEAD REDHORSE	WILSON RIVER	MAY 02 - MAY 19	7.1	15.2	*	TOTAL	SAMPLED	44	369.1	327.0	454.0	44
							MALES	16	357.9	327.0	398.0	
							FEMALES	28	375.5	330.0	454.0	
SHORTHEAD REDHORSE	VERMILION RIVER	MAY 12 - MAY 17	9.0	16.1	*	TOTAL	SAMPLED	3	368.0	341.0	407.0	3
							MALES					
							FEMALES	3	368.0	341.0	407.0	
SHORTHEAD REDHORSE	EDWARDS CREEK	15-MAY-82		12.0	**	TOTAL	SAMPLED	5	359.0	335.0	379.0	5
							MALES	3	354.3	335.0	365.0	
							FEMALES	2	367.0	355.0	379.0	
SHORTHEAD REDHORSE	OCHRE RIVER	APR 30 - MAY 24	5.0	21.0	***	TOTAL	SAMPLED	90	357.5	316.0	428.0	90
							MALES	49	352.2	320.0	403.0	
							FEMALES	31	367.7	316.0	428.0	

Table 2. Continued.

SPECIES	LOCATION	TIMING OF SPAWNING RUN 1982	WATER TEMP (°C) MIN	MAX			N	FORK LENGTH (MM) MEAN	MIN	MAX	TOTAL COUNTED
SHORTHEAD REDHORSE	TURTLE RIVER	APR 05 - MAY 23	5.6	14.3	*	TOTAL SAMPLED	9	371.7	328.0	426.0	9
						MALES	3	365.3	328.0	416.0	
						FEMALES	5	376.8	334.0	426.0	
QUILLBACK	WILSON RIVER	APR 29 - MAY 19	7.1	15.2	***	TOTAL SAMPLED	83	421.1	336.0	514.0	83
						MALES	53	409.7	336.0	492.0	
						FEMALES	30	441.2	396.0	514.0	
QUILLBACK	VERMILION RIVER	MAY 03 - MAY 20	7.5	16.1	*	TOTAL SAMPLED	257	429.5	225.0	555.0	257
						MALES	69	412.7	361.0	555.0	
						FEMALES	188	435.6	225.0	532.0	
QUILLBACK	EDWARDS CREEK	MAY 05 - MAY 22	6.0	19.0	**	TOTAL SAMPLED	143	417.9	294.0	527.0	146
						MALES	67	400.23	294.0	489.0	
						FEMALES	76	433.5	374.0	527.0	
QUILLBACK	OCHRE RIVER	MAY 05 - MAY 31	11.5	22.3	***	TOTAL SAMPLED	574	417.6	284.0	528.0	574
						MALES	294	406.0	284.0	498.0	
						FEMALES	270	430.3	359.0	528.0	
QUILLBACK	TURTLE RIVER	MAY 12 - MAY 15	8.0	16.0	*	TOTAL SAMPLED	4	422.5	407.0	441.0	4
						MALES	1	407.0	407.0	407.0	
						FEMALES					
SILVER REDHORSE	WILSON RIVER	15-MAY-82	13.8	15.0	*	TOTAL SAMPLED	2	482.5	456.0	507.0	2
						MALES	2	481.5	456.0	507.0	
						FEMALES					
SILVER REDHORSE	OCHRE RIVER	MAY 13 - MAY 28	13.9	22.3	***	TOTAL SAMPLED	5	463.6	450.0	476.0	5
						MALES	2	460.5	450.0	470.0	
						FEMALES	1	476.0	476.0	476.0	
CARP	WILSON RIVER	APR 26 - MAY 12	8.0	14.1	***	TOTAL SAMPLED	2	580.5	573.5	588.0	3
						MALES	1	588.0	588.0	588.0	
						FEMALES	1	573.0	573.0	573.0	
CARP	VERMILION RIVER	MAY 03 - MAY 11	7.4	13.8	*	TOTAL SAMPLED	8	594.8	493.0	704.0	9
						MALES	6	593.5	540.0	664.0	
						FEMALES	1	704.0	704.0	704.0	
CARP	TURTLE RIVER	MAY 01 - MAY 25	5.6	16.0	*	TOTAL SAMPLED	20	652.0	574.0	745.0	20
						MALES	12	638.0	574.0	697.0	
						FEMALES	4	688.5	582.0	745.0	

Table 2. Continued.

SPECIES	LOCATION	TIMING OF SPAWNING RUN 1982	WATER TEMP (°C) MIN	MAX			N	FORK LENGTH (MM) MEAN	MIN	MAX	TOTAL COUNTED
YELLOW PERCH	WILSON RIVER	MAY 12 - MAY 19	8.5	15.2	*	TOTAL SAMPLED	5	172.0	161.0	182.0	5
						MALES	3	167.3	161.0	175.0	
						FEMALES					
YELLOW PERCH	VERMILION RIVER	MAY 16 - MAY 20	10.1	14.5	*	TOTAL SAMPLED	4	182.3	165.0	213.0	4
						MALES					
						FEMALES	4	182.3	165.0	213.0	
YELLOW PERCH	EDWARDS CREEK	28-MAY-82	18.5		**	TOTAL SAMPLED	1	195.0	195.0	195.0	1
						MALES	1	195.0	195.0	295.0	
						FEMALES					
YELLOW PERCH	CROOKED CREEK	MAY 12 - MAY 14	10.0	19.2	*	TOTAL SAMPLED	2	171.0	171.0	171.0	2
						MALES	1	171.0	171.0	171.0	
						FEMALES	1	171.0	171.0	171.0	
YELLOW PERCH	OCHRE RIVER	MAY 11 - MAY 12	13.5	19.7	*	TOTAL SAMPLED	4	155.0	128.0	179.0	4
						MALES	4	155.0	128.0	179.0	
						FEMALES					
YELLOW PERCH	TURTLE RIVER	MAY 18 - MAY 20	8.2	10.5	*	TOTAL SAMPLED	4	168.0	142.0	186.0	4
						MALES	2	183.0	180.0	186.0	
						FEMALES	1	164.0	164.0	164.0	
SAUGER	OCHRE RIVER	12-MAY-82	13.6	19.7	*	TOTAL SAMPLED	1	407.0	407.0	407.0	1
						MALES					
						FEMALES	1	407.0	407.0	407.0	
BURBOT	VERMILION RIVER	27-APR-82	5.0		**	TOTAL SAMPLED	1	605.0	605.0	605.0	1
BURBOT	MOSSY RIVER	APR 26 - APR 27	4.0	5.0	**	TOTAL SAMPLED	2	495.0	490.0	499.0	2
BURBOT	EDWARDS RIVER	17-MAY-87	8.5		**	TOTAL SAMPLED	1	434.0	434.0	434.0	1
GOLDEYE	OCHRE RIVER	22-MAY-82	15.5	19.6	*	TOTAL SAMPLED	1	282.0	282.0	282.0	1
						MALES	1	282.0	282.0	282.0	
GOLDEYE	TURTLE RIVER	24-MAY-82	14.0	16.0	*	TOTAL SAMPLED	1	305.0	305.0	305.0	1

* RYAN THERMISTOR
** ROD THERMOMETER
*** COMBINED ROD AND RYAN THERMOMETER

Table 3. Data on minor fish species captured in Dauphin Lake Streams, 1982.

SPECIES	SEX	N	MEAN FK.LT.	MEAN AGE	MIN. FK.LT.	MAX.FK.LT.	MIN. AGE	MAX. AGE
SILVER REDHORSE	FEMALE	3	479.7	9.3	456.0	507.0	8.0	11.0
SILVER REDHORSE	MALE	4	460.5	10.7	450.0	470.0	8.0	11.0
GOLDEYE	MALE	1	282.0	5.0	282.0	282.0	5.0	5.0
BURBOT	FEMALE	1	434.0	*	434.0	434.0	*	*
YELLOW PERCH	FEMALE	6	177.3	4.0	164.0	213.0	4.0	4.0
YELLOW PERCH	MALE	11	168.5	4.7	128.0	195.0	4.0	5.0
CARP	FEMALE	6	671.8	13.5	573.0	745.0	11.0	17.0
CARP	MALE	19	621.7	13.0	540.0	697.0	7.0	19.0

* - No Data
FK.LT. - Fork length

Table 4. Fish species sampled by electroshocker and seines in Dauphin Lake streams, 1982.

SPECIES		LOCATION														
		MOSSY RIVER	MINK RIVER	VALLEY RIVER	WILSON RIVER	VERMILION RIVER	EDWARDS CREEK	CROOKED CREEK	CRAWFORD CREEK	OCHRE RIVER	TURTLE RIVER	BROWNS CREEK	RANCH CREEK	RENNICKER CREEK	RENFREW CREEK
EMERALD SHINER	NOTROPIS ATHERINOIDES	*	*			*	*			*	*				
COMMON SHINER	NOTROPIS CORNUTUS		*	*	*	*	*	*		*	*		*	*	*
BLACKCHIN SHINER	NOTROPIS HETERODON	*						*			*				
SPOTTAIL SHINER	NOTROPIS HUDSONIUS	*	*	*			*			*	*				
FATHEAD MINNOW	PIMEPHALES PROMELAS	*	*		*	*	*		*	*	*		*	*	
BRASSY MINNOW	HYBOGNATHUS HANKINSONI		*			*	*		*	*	*				
LONGNOSE DACE	RHINICHTHYS CATARACTAE		*	*	*	*	*		*	*	*				
BLACKNOSE DACE	RHINICHTHYS ATRATULUS		*	*	*	*	*		*	*	*		*		
FINESCALE DACE	PHOXINUS NEOGAEUS				*		*		*	*	*				
NORTHERN REDBELLY DACE	PHOXINUS EOS					*									
PEARL DACE	SEMOTILUS MARGARITA		*			*			*	*			*		
CREEK CHUB	SEMOTILUS ATROMACULATUS		*		*	*	*		*	*	*		*	*	*
IOWA DARTER	ETHEOSTOMA EXILE	*					*			*	*				
RIVER DARTER	PERCINA SHUMARDI			*		*	*			*	*				
JOHNNY DARTER	ETHEOSTOMA NIGRUM	*	*	*	*	*	*			*	*		*		
LOG PERCH	PERCINA CAPRODES	*	*		*	*	*			*	*				
BROOK STICKLEBACK	CULAEA INCONSTANS		*		*	*	*			*	*	*	*	*	
TROUT PERCH	PERCOPSIS OMISCOMAYCUS										*				
NORTHERN PIKE	ESOX LUCIUS	*	*	*	*	*		*			*				
WHITE SUCKER	CATOSTOMUS COMMERSONI		*	*	*	*	*			*	*		*	*	*
CARP	CYPRINUS CARPIO		*							*	*				
QUILLBACK	CARPIODES CYPRINUS					*	*				*				
SHORTHEAD REDHORSE	MOXOSTOMUS MACROLEPIDOTUM				*		*			*	*				
YELLOW PERCH	PERCA FLAVESCENS	*													
TOTAL NO.		9	15	8	12	16	17	3	7	18	20	1	8	5	3

Table 5. Numbers of each species collected at each station in a survey of the resident stream fishes of Dauphin Lake tributary and outlet streams, 1982.

STREAM	DATE	LOC.	STREAM LEVEL*	LATITUDE	LONGITUDE	REF. NUMBER	Catostomus commersoni	Moxostoma macrolepidotum	Carpiodes cyprinus
Vermilion River	June 22-29	Warden station	1	(50° 58′ 20″ N,	100° 15′ 30″ W)	1	5(fry)1	0	0
		West tributary	2	(50° 58′ 30″ N,	100° 16′ 25″ W)	2	1	0	0
		Control structure	4	(51° 00′ 25″ N,	100° 10′ 05″ W)	3	10	0	0
		Reservoir site	5	(51° 00′ 25″ N,	100° 10′ 05″ W)	4	1	0	0
		Site #2	6	(52° 07′ 30″ N,	100° 00′ 00″ W)	5	(fry) 2	0	0
		Site #3	7	(51° 05′ 50″ N,	100° 08′ 00″ W)	6	0	0	0
		Hyw #20 crossing	8	(51° 11′ 20″ N,	100° 00′ 45″ W)	7	numerous fry	0	0
Vermilion River	Aug 9-11	Warden station	1	(50° 58′ 20″ N,	100° 15′ 30″ W)	8	90	0	0
		West tributary	2	(50° 58′ 30″ N,	100° 16′ 25″ W)	9	22	0	0
		Below control structure	4	(51° 00′ 25″ N,	100° 10′ 05″ W)	10	1	0	0
		Site #2	6	(51° 07′ 30″ N,	100° 05′ 00″ W)	11	18	0	1
		Site #3	7	(51° 05′ 50″ N,	100° 08′ 00″ W)	12	8	0	0
		Hyw #20 crossing	8	(51° 11′ 20″ N,	100° 00′ 45″ W)	13	16	0	0
Vermilion River	Sept.21-24	West Tributary	2	(50° 58′ 30″ N,	100° 16′ 25″ W)	14	6	0	0
		Keld Park	3	(50° 58′ 20″ N,	100° 15′ 20″ W)	15	6	0	0
		Site #2	6	(51° 07′ 30″ N,	100° 05′ 00″ W)	16	10	0	0
		Site #3	7	(51° 05′ 50″ N,	100° 08′ 00″ W)	17	4	0	0
		Hyw #20 crossing	8	(51° 11′ 20″ N,	100° 00′ 45″ W)	18	19	0	0
Mink Creek	June 22-29	Site #9	1	(51° 22′ 00″ N,	100° 30′ 30″ W)	19	0	0	0
		Site #2	2	(51° 23′ 30″ N,	100° 30′ 05″ W)	20	0	0	0
		Pr. Rd. #274 crossing	3	(51° 24′ 55″ N,	100° 29′ 05″ W)	21	5	0	0
		Hyw #10 crossing	4	(51° 25′ 00″ N,	100° 20′ 45″ W)	22	numerous fry	0	0
		Hyw #20 crossing	5	(51° 25′ 55″ N,	100° 00′ 55″ W)	23	5	0	0
		1st. rd. crossing upstream	6	(51° 25′ 55″ N,	99° 59′ 45″ W)	24	1(fry)	0	0
Mink Creek	Aug 9-11	Site #9	1	(51° 22′ 00″ N,	100° 30′ 30″ W)	25	0	0	0
		Pr. Rd. #274 crossing	3	(51° 24′ 55″ N,	100° 29′ 05″ W)	26	2	0	0
		Hyw #10 crossing	4	(51° 25′ 00″ N,	100° 20′ 45″ W)	27	1	0	0
		Hyw #20 crossing	5	(51° 25′ 55″ N,	100° 00′ 55″ W)	28	0	0	0
		1st. rd. crossing upstream	6	(51° 25′ 55″ N,	99° 59′ 45″ W)	29	0	0	0
Mink Creek	Sept 21-24	Pr. Rd. #274 crossing	3	(51° 24′ 55″ N,	100° 29′ 05″ W)	30	1	0	0
		Hyw #10 crossing	4	(51° 25′ 00″ N,	100° 20′ 45″ W)	31	6	0	0
		Hyw #20 crossing	5	(51° 25′ 55″ N,	100° 00′ 55″ W)	32	0	0	0
Wilson River	June 22-29	Rr. Rd. #274 crossing	1	(51° 06′ 50″ N,	100° 27′ 00″ W)	33	0	0	0
		Hyw # 5/10 crossing	2	(51° 09′ 25″ N,	100° 20′ 05″ W)	34	0	0	0
		Hyw #10 crossing	3	(51° 10′ 10″ N,	100° 17′ 50″ W)	35	numerous fry	0	0
		Hyw #20 crossing	4	(51° 12′ 45″ N,	100° 00′ 50″ W)	36	0	1	0

Table 5. Continued.

REF. NUMBER	Cyprinus carpio	Esox lucius	Phoxinus eos	Phoxinus neogaeus	Pimephales promelas	Rhinichthys atratulus	Rhinichthys cataractae	Notropis hudsonius	Notropis cornutus	Notropis athrinoides	Notropis heterodon
1	0	0	0	0	4	6	1	0	4	0	0
2	0	0	0	0	12	3	0	0	19	0	0
3	0	0	1	0	24	4	1	0	7	0	0
4	0	0	0	0	3	23	0	0	15	0	0
5	0	0	0	0	10	5	0	0	80	0	0
6	0	0	0	0	22	20	0	0	85	0	0
7	0	0	0	0	1	5	0	0	13	37	0
8	0	0	0	0	1	0	0	0	19	0	0
9	0	0	0	0	6	28	2	0	52	0	0
10	0	0	0	0	5	17	0	0	65	0	0
11	0	0	0	0	1	1	0	0	29	0	0
12	0	0	0	0	0	2	3	0	9	0	0
13	0	1	0	0	1	11	12	0	8	0	0
14	0	0	0	0	0	18	0	0	7	0	0
15	0	0	0	0	1	24	2	0	22	0	0
16	0	0	0	0	0	13	0	0	14	0	0
17	0	0	0	0	0	15	0	0	57	0	0
18	0	0	0	0	9	15	5	0	30	0	0
19	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	3	0	0	0	0	0
21	0	0	0	0	2	9	1	0	8	0	0
22	0	0	0	0	3	3	0	0	0	0	0
23	0	8 (YOY)	0	0	0	1	0	3	1	0	0
24	0	1 (YOY)	0	0	0	0	0	0	0	1	0
25	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	31	0	0	42	0	0
27	0	0	0	0	1	4	0	0	10	0	0
28	0	2	0	0	0	0	0	0	0	0	0
29	7	1	0	0	69	0	0	3	8	2	1
30	0	0	0	0	0	13	0	0	6	0	0
31	0	0	0	0	6	23	2	0	0	0	0
32	0	0	0	0	12	0	0	1	0	0	0
33	0	0	0	2	137	1	0	0	8	0	0
34	0	0	0	0	0	1	0	0	0	0	0
35	0	0	0	0	3	0	0	0	1	0	0
36	0	6 (YOY)	0	0	0	0	0	0	14	0	0

Table 5. Continued

REF. NUMBER	Semotilus atromaculatus	Semotilus margarita	Hybognathus hankinsoni	Culaea inconstans	Percopis omiscomaycus	Perca flavescens	Percina caprodes	Percina shumardi	Etheostoma nigrum	Etheostoma exile
1	1	0	0	2	0	0	0	0	19	0
2	3	0	0	0	0	0	0	0	2	0
3	5	1	2	0	0	0	0	0	6	0
4	1	0	0	0	0	0	0	0	6	0
5	0	1	0	0	0	0	0	0	2	0
6	1	0	0	0	0	0	0	0	15	0
7	0	0	0	0	0	0	0	0	0	0
8	23	0	0	1	0	0	0	0	3	0
9	3	0	0	1	0	0	0	0	16	0
10	15	0	0	1	0	0	0	0	9	0
11	25	0	0	0	0	0	0	0	13	0
12	24	0	0	0	0	0	0	0	21	0
13	0	0	0	0	0	0	1	1	2	0
14	0	0	0	0	0	0	0	0	8	0
15	3	0	0	0	0	0	0	0	2	0
16	0	0	0	0	0	0	0	0	4	0
17	2	0	0	0	0	0	0	0	4	0
18	0	0	0	0	0	0	0	3	5	0
19	0	1	0	3	0	0	0	0	3	0
20	0	0	0	0	0	0	0	0	1	0
21	0	1	0	3	0	0	0	0	9	0
22	0	1	0	5	0	0	0	0	1	0
23	0	0	0	0	0	0	1	0	0	0
24	0	0	0	0	0	0	0	0	0	0
25	0	0	0	3	0	0	0	0	3	0
26	4	0	1	1	0	0	0	0	8	0
27	5	7	0	1	0	0	0	0	1	0
28	0	0	0	0	0	0	0	0	1	0
29	0	0	0	0	0	0	0	0	7	0
30	0	0	0	0	0	0	0	0	10	0
31	6	1	0	9	0	0	0	0	2	0
32	0	0	0	0	0	0	0	0	2	0
33	0	0	0	8	0	0	0	0	0	0
34	0	0	0	1	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
36	3	0	0	0	0	0	11	0	0	0

Table 5. Continued.

STREAM	DATE	LOC.	STREAM LEVEL*	LATITUDE	LONGITUDE	REF. NUMBER	Catostomus commersoni	Moxostoma macrolepidotum	Carpiodes cyprinus
Wilson River	Aug 9-11	2 miles west of #274 crossing	1	(51° 07' 10" N,	100° 31' 50" W)	37	0	0	0
		Hyw # 5/10 crossing	2	(51° 09' 25" N,	100° 20' 05" W)	38	14	0	0
		Hyw #10 crossing	3	(51° 10' 10" N,	100° 17' 50" W)	39	53	0	0
		Hyw #20 crossing	4	(51° 12' 45" N,	100° 00' 50" W)	40	0	0	0
Wilson River	Sept 21-24	Hyw # 5/10 crossing	2	(51° 09' 25" N,	100° 20' 05" W)	41	2	0	0
		Hyw #10 crossing	3	(51° 10' 10" N,	100° 17' 50" W)	42	6	0	0
		Hyw #20 crossing	4	(51° 12' 45" N,	100° 00' 50" W)	43	1	0	0
Edwards Creek	June 22-29	Hyw #10 crossing near Edwards Lake	1	(50° 59' 20" N,	100° 02' 50" W)	44	0	0	0
		1st crossing of Hyw #10 in Park	2	(50° 59' 20" N,	100° 03' 55" W)	45	1	0	0
		North reservoir inlet	3	(51° 01' 40" N,	100° 04" 40" W)	46	3	0	0
		Just below Reservoir	4	(51° 01' 50" N,	100° 04' 40" W)	47	0	0	0
		1st Rd. Crossing below reservior	5	(51° 03' 10" N,	100° 04' 30" W)	48	0	0	0
		Hyw #10 crossing	6	(51° 06' 40" N,	100° 03' 50" W)	49	0	0	0
		Hyw #20 crossing	7	(51° 08' 25" N,	99° 52' 20" W)	50	1, 10(fry)	0	0
		Stoney pt. Rd. crossing	8	(51° 09" 15" N,	99° 52' 30" W)	51	0	0	0
Edwards Creek	Aug 9-11	1st crossing of Hyw #10 in Park	2	(50° 59' 20" N,	100° 03' 55" W)	52	0	0	0
		Just below Reservoir	4	(51° 01' 50" N,	100° 04' 40" W)	53	2	0	0
		1st Rd. Crossing below reservior	5	(51° 03' 10" N,	100° 04' 30" W)	54	0	0	0
		Hyw #10 crossing	6	(51° 06' 40" N,	100° 03' 50" W)	55	0	0	0
		Stoney Pt. Rd. crossing	8	(51° 09" 15" N,	99° 52' 30" W)	56	14	4	5
Edwards Creek	Sept. 21-24	1st crossing of Hyw #10 in Park	2	(50° 59' 20" N,	100° 03' 55" W)	57	2	0	0
		Just below Reservoir	4	(51° 01' 50" N,	100° 04' 40" W)	58	1	0	0
		1st Rd. Crossing below reservior	5	(51° 03' 10" N,	100° 04' 30" W)	59	0	0	0
		Hyw #10 crossing	6	(51° 06' 40" N,	100° 03' 50" W)	60	1	0	0
		Hyw #20 crossing	7	(51° 08' 25" N,	99° 52' 20" W)	61	0	0	0
		Stoney pt. Rd. crossing	8	(51° 09" 15" N,	99° 52' 30" W)	62	5	0	14
Ochre River	June 22-29	Park boundary	1	(50° 54' 15" N,	99° 49' 00" W)	63	5	0	0
		Skene's crossing	2	(50° 55' 45" N,	99° 48' 40" W)	64	5	0	0
		Pr. Rd. crossing #582	3	(50° 58' 40" N,	99° 46' 40" W)	65	0	0	0
		Hyw #20 crossing	4	(51° 03' 50" N,	99° 46' 50" W)	66	0	0	0
		Rock Crossing	5	(51° 06' 10" N,	99° 45' 30" W)	67	0	0	0
Ochre River	Aug 9-11	Park boundary	1	(50° 54' 15" N,	99° 49' 00" W)	68	1	0	0
		Skene's crossing	2	(50° 55' 45" N,	99° 48' 40" W)	69	19	0	0
		Pr. Rd. crossing #582	3	(50° 58' 40" N,	99° 46' 40" W)	70	0	0	0
		Hyw #20 crossing	4	(51° 03' 50" N,	99° 46' 50" W)	71	2	0	0
		Rock Crossing	5	(51° 06' 10" N,	99° 45' 30" W)	72	7	8	0
Ochre River	Sept 21-24	Park boundary	1	(50° 54' 15" N,	99° 49' 00" W)	73	3	0	0
		Skene's crossing	2	(50° 55' 45" N,	99° 48' 40" W)	74	2	0	0
		Pr. Rd. crossing #582	3	(50° 58' 40" N,	99° 46' 40" W)	75	2	0	0
		Rock Crossing	5	(51° 06' 10" N,	99° 45' 30" W)	76	0	0	0

Table 5. Continued.

REF. NUMBER	Cyprinus carpio	Esox lucius	Phoxinus eos	Phoxinus neogaeus	Pimephales promelas	Rhinichthys atratulus	Rhinichthys cataractae	Notropis hudsonius	Notropis cornutus	Notropis athrinoides	Notropis heterodon
37	0	0	0	0	47	0	0	0	0	0	0
38	0	0	0	0	0	10	2	0	22	0	0
39	0	0	0	0	55	0	0	0	67	0	0
40	0	0	0	0	9	14	0	0	9	0	0
41	0	0	0	0	20	21	1	0	20	0	0
42	0	0	0	0	11	4	0	0	5	0	0
43	0	4	0	0	0	0	0	0	0	0	0
44	0	0	0	0	24	0	0	0	0	0	0
45	0	0	0	0	0	3	11	0	0	0	0
46	0	0	0	0	4	13	0	0	0	0	0
47	0	0	0	0	0	2	8	0	0	0	0
48	0	0	0	0	0	9	11	0	8	0	0
49	0	0	0	0	2	2	2	0	61	0	0
50	0	0	0	0	25	9	0	0	31	0	0
51	0	0	0	0	2	0	1	18	1	6	0
52	0	0	0	0	0	6	7	0	0	0	0
53	0	0	0	0	5	14	10	0	6	0	0
54	0	0	0	0	0	17	7	0	6	0	0
55	0	0	0	1	17	27	0	0	29	0	0
56	0	0	0	0	5	5	2	0	59	0	0
57	0	0	0	0	0	12	1	0	0	0	0
58	0	0	0	0	0	15	0	0	0	0	0
59	0	0	0	0	0	9	7	0	9	0	0
60	0	0	0	0	2	13	2	0	11	0	0
61	0	0	0	0	9	7	2	0	12	0	0
62	0	0	0	0	0	16	0	0	7	0	0
63	0	0	0	0	0	9	0	0	3	0	0
64	0	0	0	0	7	9	7	0	12	0	0
65	0	0	0	0	1	15	0	0	2	0	0
66	0	0	0	0	0	0	5	0	0	0	0
67	0	0	0	0	3	0	1	1	1	1	0
68	0	0	0	19	0	8	2	0	15	0	0
69	0	0	0	1	0	4	12	0	10	0	0
70	0	0	0	0	0	2	0	0	4	0	0
71	0	0	0	0	5	0	2	0	18	0	0
72	5	0	0	0	1	0	0	0	23	0	0
73	0	0	0	0	0	2	8	0	16	0	0
74	0	0	0	0	0	41	14	0	24	0	0
75	0	0	0	0	0	8	7	0	13	0	0
76	0	0	0	0	0	1	5	0	13	0	0

Table 5. Continued

REF. NUMBER	Semotilus atromaculatus	Semotilus margarita	Hybognathus hankinsoni	Culaea inconstans	Percopis omiscomaycus	Perca flavescens	Percina caprodes	Percina shumardi	Etheostoma nigrum	Etheostoma exile
37	1	0	0	25	0	0	0	0	0	0
38	57	0	0	0	0	0	0	0	4	0
39	7	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	1	0	12	0
41	18	0	0	0	0	0	0	0	1	0
42	18	0	0	1	0	0	0	0	6	0
43	0	0	0	0	0	0	0	0	5	0
44	0	0	0	1	0	0	0	0	0	0
45	1	0	0	0	0	0	0	0	0	0
46	3	0	0	0	0	0	0	0	1	0
47	2	0	0	1	0	0	0	0	6	0
48	0	0	0	0	0	0	0	0	1	0
49	0	0	0	0	0	0	0	0	0	0
50	3	0	0	0	0	0	0	0	0	0
51	0	0	0	0	0	0	2	3	1	4
52	5	0	0	0	0	0	0	0	1	0
53	25	0	0	0	0	0	0	0	4	0
54	26	0	0	0	0	0	0	0	4	0
55	58	0	3	0	0	0	0	0	6	0
56	21	0	0	0	0	0	0	0	4	0
57	9	4	0	0	0	0	0	0	4	0
58	9	0	0	0	0	0	0	0	0	0
59	20	0	0	0	0	0	0	0	4	0
60	1	0	0	2	0	0	0	0	7	0
61	9	0	0	0	0	0	0	0	21	0
62	5	0	0	0	0	0	0	0	7	0
63	1	0	0	0	0	0	0	0	0	0
64	1	0	0	0	0	0	0	0	5	0
65	0	2	0	0	0	0	0	0	9	0
66	0	0	0	0	0	0	0	0	0	0
67	0	0	0	1	0	0	1	3	1	0
68	18	0	0	0	0	0	0	0	5	0
69	43	0	6	0	0	0	0	0	5	0
70	9	0	0	0	0	0	0	0	10	0
71	2	0	0	0	0	0	0	0	0	0
72	2	0	0	0	0	0	0	0	18	1
73	1	1	0	0	0	0	0	0	3	0
74	38	13	0	0	0	0	0	0	4	0
75	8	0	0	0	0	0	0	0	4	0
76	0	0	0	0	0	0	0	0	1	0

Table 5. Continued

STREAM	DATE	LOC.	STREAM LEVEL*	LATITUDE	LONGITUDE	REF. NUMBER	Catostomus commersoni	Moxostoma macrolepidotum	Carpiodes cyprinus
Crawford Creek	June 22-29	Site #3 Park Boundary	1	(50° 59' 10" N,	99° 52' 30" W)	77	0	0	0
		Site #2	2	(51° 00' 27" N,	99° 51' 45" W)	78	0	0	0
		Site #1	3	(51° 03' 15" N,	99° 49' 25" W)	79	0	0	0
Crawford Creek	Aug 9-11	Site #3 Park Boundary	1	(50° 59' 10" N,	99° 52' 30" W)	80	0	0	0
		Site #2	2	(51° 00' 27" N,	99° 51' 45" W)	81	0	0	0
Crawford Creek	Sept 21-24	Site #3 Park Boundary	1	(50° 59' 10" N,	99° 52' 30" W)	82	0	0	0
		Site #2	2	(51° 00' 27" N,	99° 51' 45" W)	83	0	0	0
Turtle River	June 22-29	Below Reservoir structure	3	(51° 03' 00" N,	99° 31' 53" W)	84	0	0	0
		Hyw #5 crossing	4	(51° 03' 10" N,	99° 31' 45" W)	85	0	0	0
		St. Rose duLac	5	(51° 04' 00" N,	99° 31' 45" W)	86	0	0	0
Turtle River	Aug 9-11	Hyw #5 crossing (South loc.)	1	(50° 55' 00" N,	99° 30' 50" W)	87	9	0	0
		Site #2	2	(50° 59' 59" N,	99° 31' 45" W)	88	24	0	0
		Below Reservoir structure	3	(51° 03' 00" N,	99° 31' 53" W)	89	3	3	1
		Ste Rose duLac	5	(51° 04' 00" N,	99° 31' 45" W)	90	0	1	0
Turtle River	Sept 21-24	Below Reservoir structure	3	(51° 03' 00" N,	99° 31' 53" W)	91	4	10	0
Valley River	June 22-29	1st bridge crossing from lake	1	(51° 18' 50" N,	99° 56' 50" W)	92	numerous fry	0	0
	Aug 9-11	1st bridge crossing from lake	1	(51° 18' 50" N,	99° 56' 50" W)	93	1	0	0
	Sept 21-24	Hyw #20 crossing	1	(52° 16' 57" N,	100° 00' 55" W)	94	0	0	0
Mossey River	June 22-29	Downstream of control structure	1	(51° 26' 55" N,	99° 56' 54" W)	95	0	0	0
	Aug 9-11	Downstream of control structure	1	(51° 26' 55" N,	99° 56' 54" W)	96	0	0	0
Crooked Creek	June 22-29	Just South of Hyw #20	1	(51° 08' 00" N,	99° 49' 15" W)	97	0	0	0
	Aug.9-11	Just South of Hyw #20	1	(51° 08' 00" N,	99° 49' 15" W)	98	1	0	0
Ranch Creek	June 22-29	Pr. Rd. #274 crossing	1	(51° 02' 12" N,	100° 26' 20" W)	99	3	0	0
	Aug 9-11	Pr. Rd. #274 crossing	1	(51° 02' 12" N,	100° 26' 20" W)	100	49	0	0
Browns Creek	June 22-29	Pr. Rd. #274 crossing	1	(51° 06' 30" N,	100° 29' 00" W)	101	0	0	0
	Aug 9-11	Pr. Rd. #274 crossing	1	(51° 06' 30" N,	100° 29' 00" W)	102	0	0	0
Rennicker Creek	Aug 9-11	Pr. Rd. #274 crossing	1	(51° 05' 20" N,	100° 29' 05" W)	103	6	0	0
Renfrew Creek	Sept 21-24	Pr. Rd. #274 crossing	1	(51° 02' 15" N,	100° 24' 20" W)	104	7	0	0

Table 5. Continued.

REF. NUMBER	Cyprinus carpio	Esox lucius	Phoxinus eos	Phoxinus neogaeus	Pimephales promelas	Rhinichthys atratulus	Rhinichthys cataractae	Notropis hudsonius	Notropis cornutus	Notropis athrinoides	Notropis heterodon
77	0	0	0	0	0	12	9	0	0	0	0
78	0	0	0	2	2	4	1	0	0	0	0
79	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	11	2	0	0	0	0
81	0	0	0	0	0	1	0	0	0	0	0
82	0	0	0	0	2	17	5	0	0	0	0
83	0	0	0	0	0	11	5	0	0	0	0
84	0	0	0	0	1	0	1	1	9	6	0
85	0	0	0	0	0	2	2	0	0	0	0
86	0	0	0	0	28	0	0	0	9	16	1
87	0	1	0	0	0	0	0	0	30	0	0
88	0	0	0	0	0	0	0	0	24	0	0
89	1	0	0	0	13	0	0	0	45	2	0
90	0	0	0	0	0	0	0	0	6	0	0
91	0	0	0	0	27	4	17	0	26	0	0
92	0	1(YOY)	0	0	0	0	0	1	5	0	0
93	0	0	0	0	0	0	0	2	31	0	0
94	0	0	0	0	0	20	6	0	10	0	0
95	0	1(YOY)	0	0	6	0	0	21	0	9	5
96	0	0	0	0	12	0	0	1	0	14	0
97	0	0	0	0	0	0	0	0	0	1	4
98	0	1	0	0	0	0	0	0	0	0	0
99	0	0	0	0	2	6	0	0	3	0	0
100	0	0	0	0	0	0	0	0	58	0	0
101	0	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	38	0	0	0	26	0	0
104	0	0	0	0	0	0	0	0	2	0	0

Table 5. Continued.

REF. NUMBER	Semotilus atromaculatus	Semotilus margarita	Hybognathus hankinsoni	Culaea inconstans	Percopis omiscomaycus	Perca flavescens	Percina caprodes	Percina shumardi	Etheostoma nigrum	Etheostoma exile
77	2	0	0	0	0	0	0	0	0	0
78	10	38	2	0	0	0	0	0	0	0
79	0	1	0	0	0	0	0	0	0	0
80	0	35	0	2	0	0	0	0	0	0
81	14	18	0	0	0	0	0	0	0	0
82	4	35	0	2	0	0	0	0	0	0
83	24	12	0	1	0	0	0	0	0	0
84	0	0	0	6	0	0	5	22	3	2
85	0	0	0	0	0	0	0	0	0	0
86	0	0	20	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0
88	6	0	58	0	0	0	0	0	9	0
89	0	0	6	0	1	0	4	8	0	0
90	0	0	0	1	0	0	0	0	3	0
91	1	0	0	1	0	0	0	1	3	0
92	0	0	0	0	0	0	0	0	2	0
93	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	2	4	0
95	0	0	0	0	0	8	0	0	7	4
96	0	0	0	0	0	0	1	0	10	7
97	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0
99	1	2	0	0	0	0	0	0	2	0
100	15	0	0	7	0	0	0	0	1	0
101	0	0	0	7	0	0	0	0	0	0
102	0	0	0	3	0	0	0	0	0	0
103	7	0	0	10	0	0	0	0	0	0
104	9	0	0	0	0	0	0	0	0	0

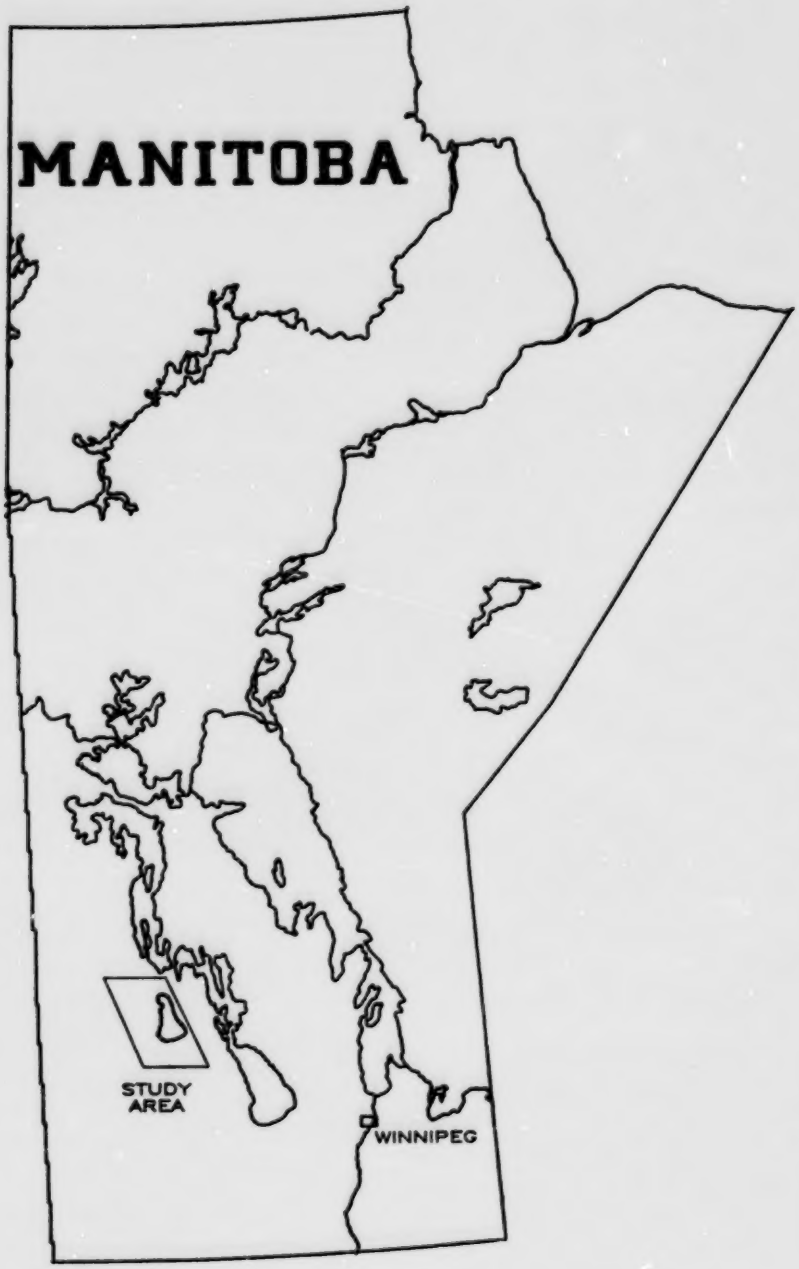

Fig. 1. Map showing location of Dauphin Lake and study area.

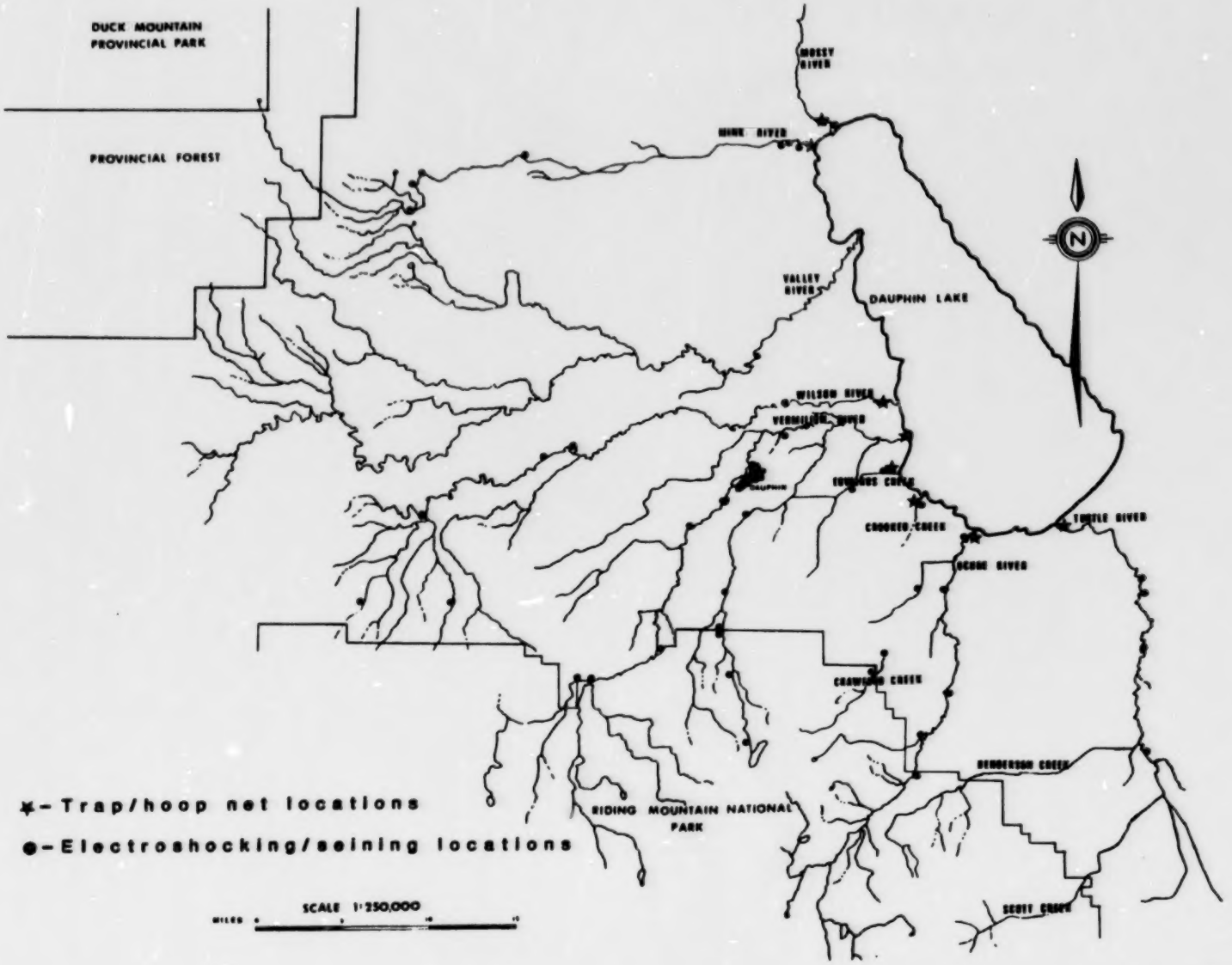

Fig. 2. Sampling locations in the Dauphin Lake drainage basin , 1982.

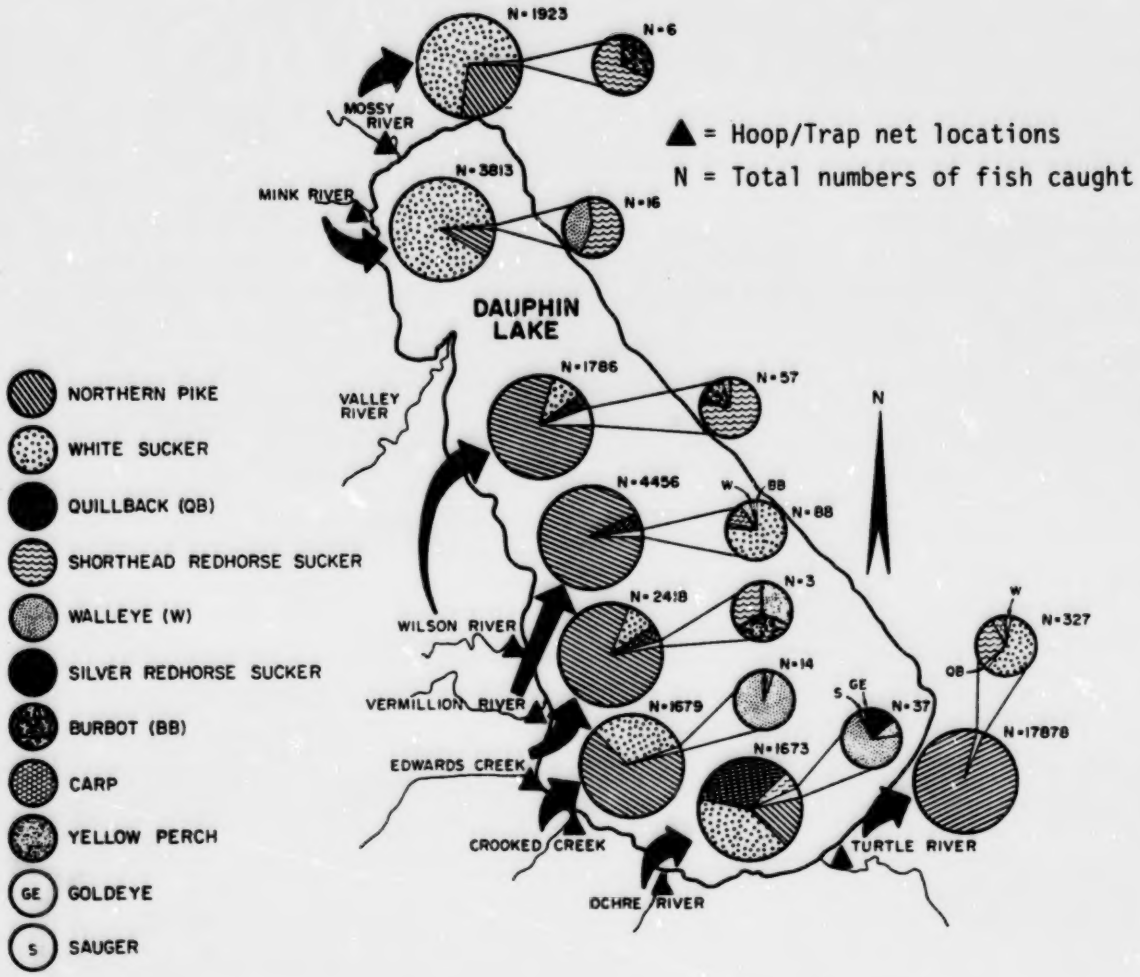

Fig. 3. Species composition of the fish migrating into the rivers of Dauphin Lake, April - May 1982.

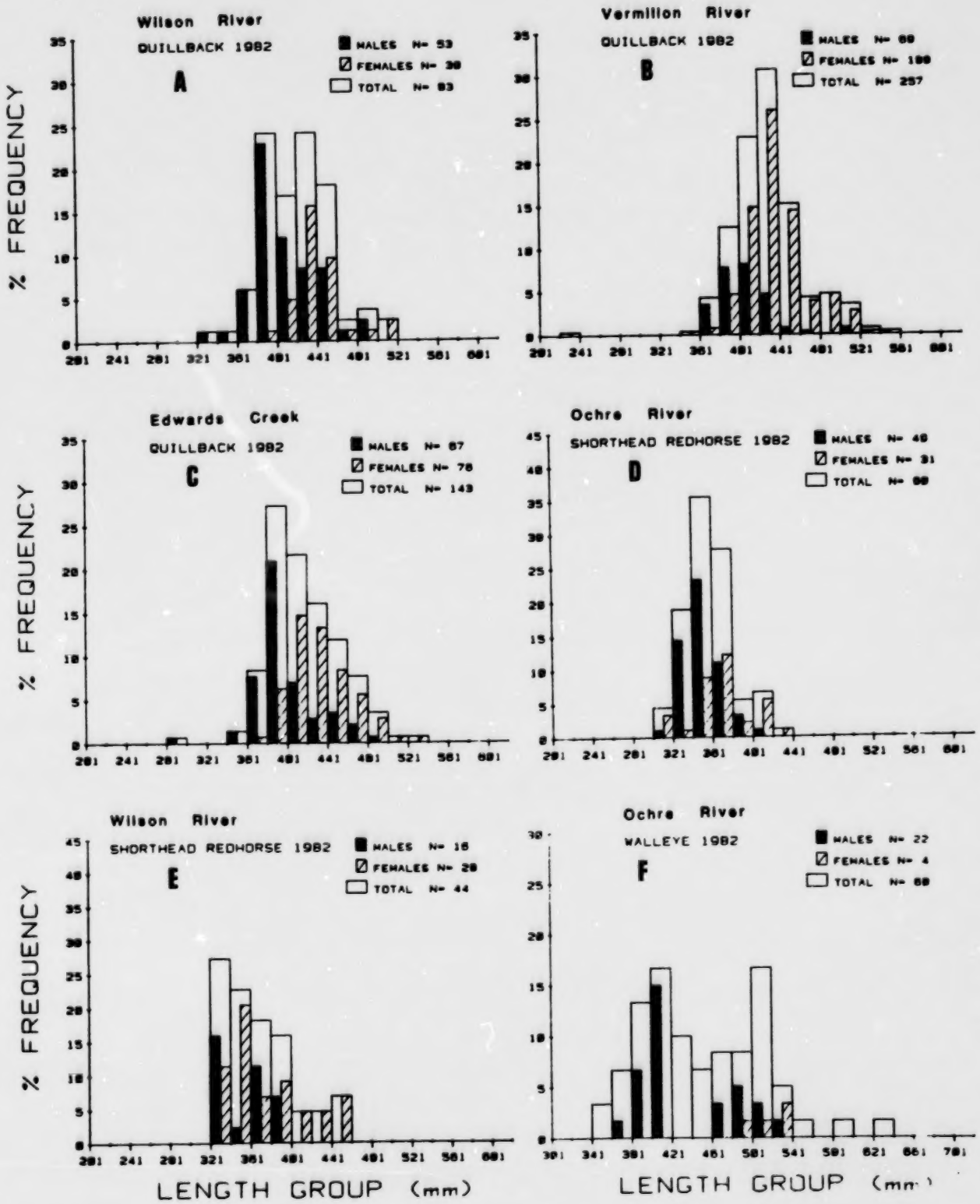

Fig. 4. Length-frequency distributions of various fish species from Dauphin Lake tributaries, 1982.

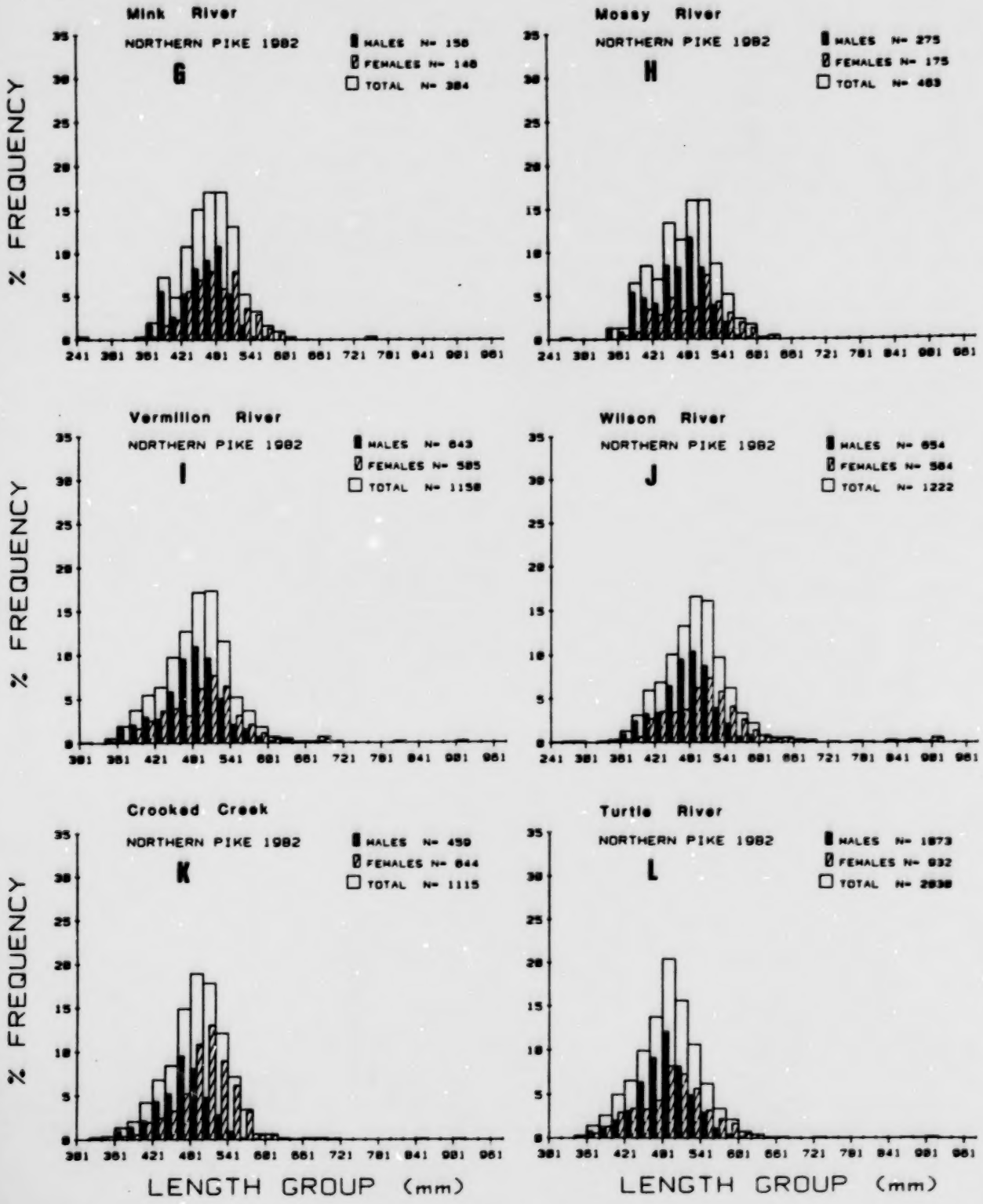
Mink River
NORTHERN PIKE 1982
G
MALES N= 158
FEMALES N= 148
TOTAL N= 384
Mossy River
NORTHERN PIKE 1982
H
MALES N= 275
FEMALES N= 175
TOTAL N= 483
Vermilion River
NORTHERN PIKE 1982
I
MALES N= 643
FEMALES N= 585
TOTAL N= 1158
Wilson River
NORTHERN PIKE 1982
J
MALES N= 654
FEMALES N= 584
TOTAL N= 1222
Crooked Creek
NORTHERN PIKE 1982
K
MALES N= 459
FEMALES N= 644
TOTAL N= 1115
Turtle River
NORTHERN PIKE 1982
L
MALES N= 1873
FEMALES N= 932
TOTAL N= 2838
% FREQUENCY
LENGTH GROUP (mm)

Fig. 4. con't

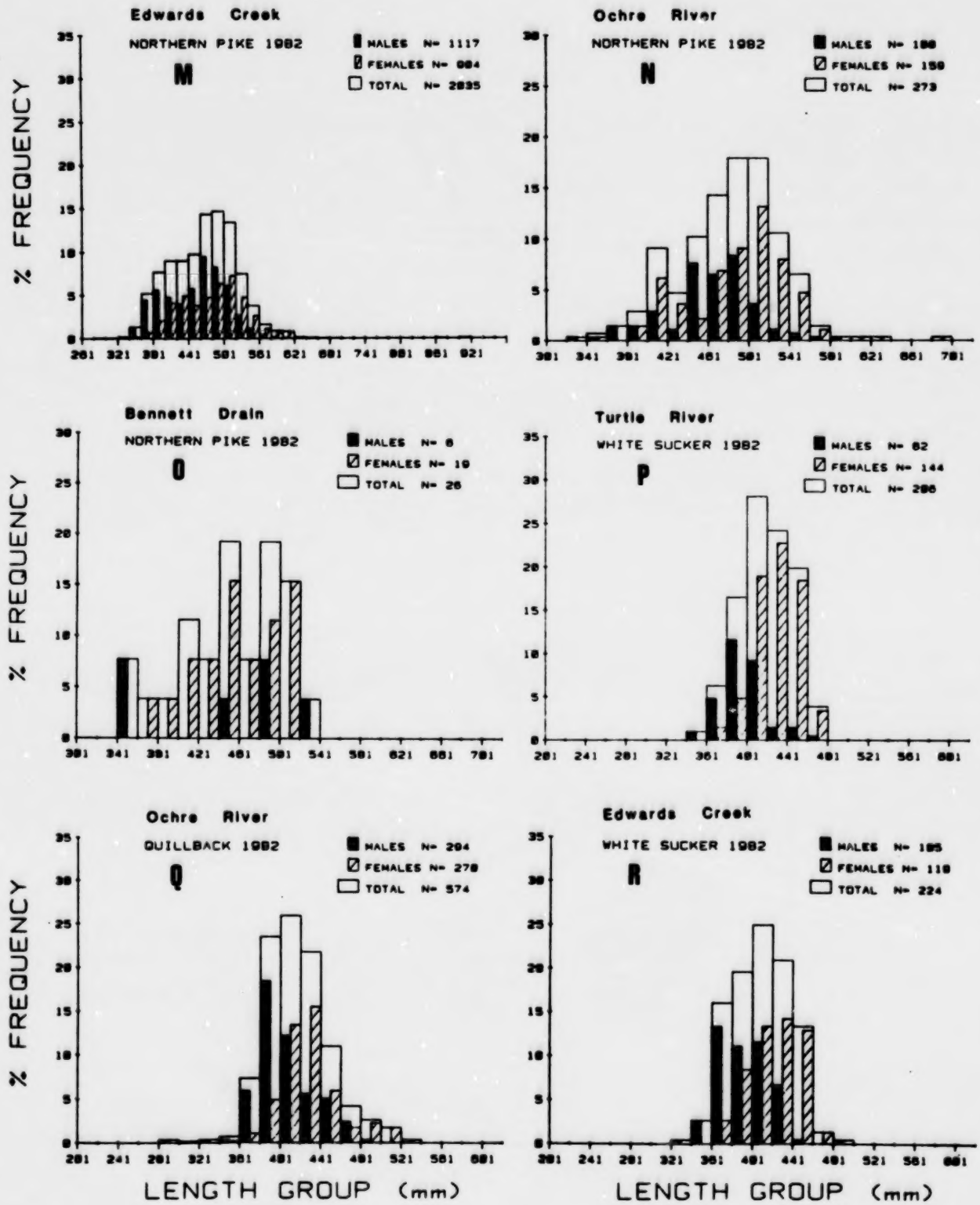
Edwards Creek
NORTHERN PIKE 1982
M
MALES N= 1117
FEMALES N= 884
TOTAL N= 2035
Ochre River
NORTHERN PIKE 1982
N
MALES N= 188
FEMALES N= 150
TOTAL N= 273
Bennett Drain
NORTHERN PIKE 1982
O
MALES N= 8
FEMALES N= 10
TOTAL N= 26
Turtle River
WHITE SUCKER 1982
P
MALES N= 82
FEMALES N= 144
TOTAL N= 286
Ochre River
QUILLBACK 1982
Q
MALES N= 294
FEMALES N= 270
TOTAL N= 574
Edwards Creek
WHITE SUCKER 1982
R
MALES N= 105
FEMALES N= 119
TOTAL N= 224
% FREQUENCY
LENGTH GROUP (mm)

Fig. 4. con't

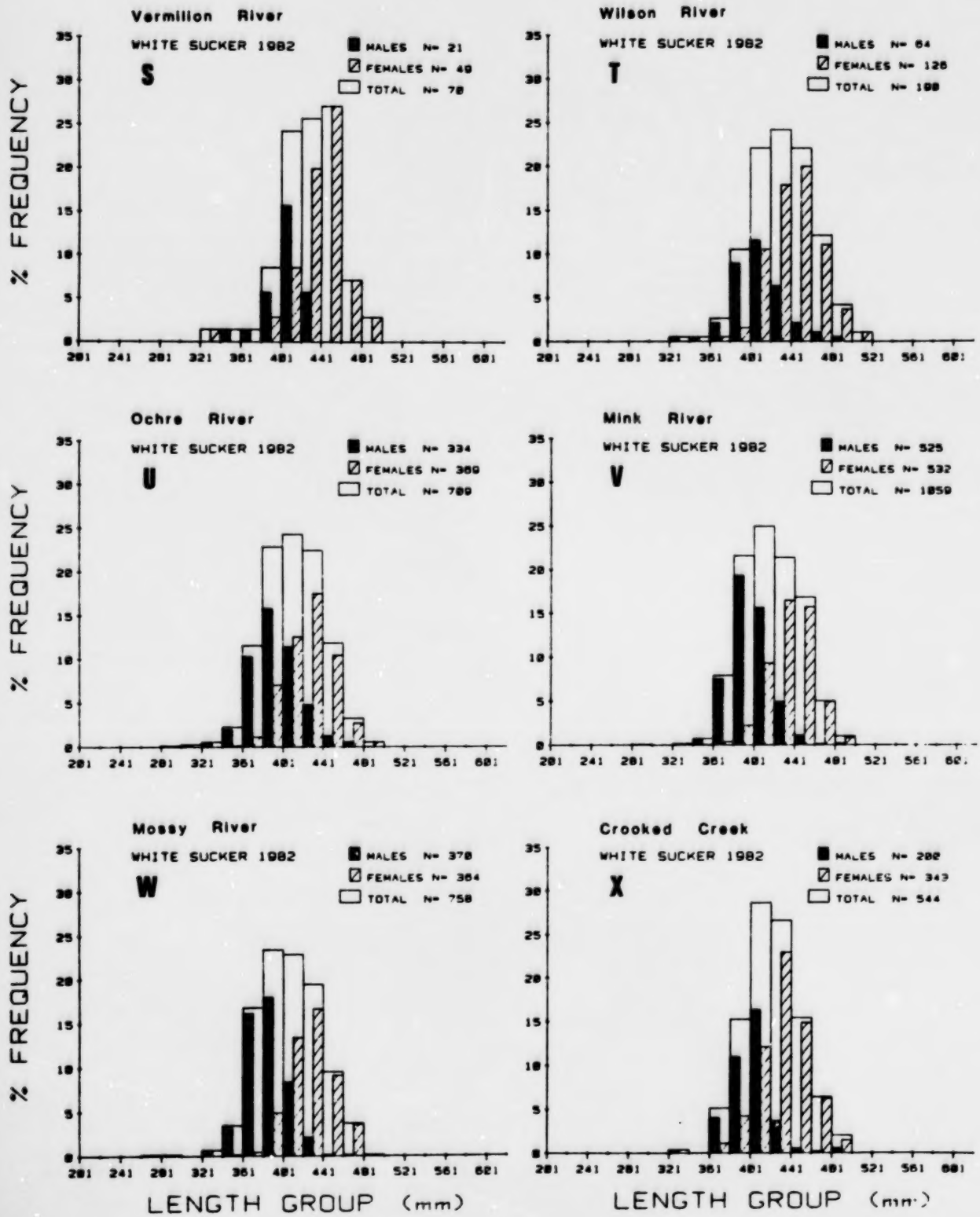
Vermilion River
WHITE SUCKER 1982
S
MALES N= 21
FEMALES N= 49
TOTAL N= 70
Wilson River
WHITE SUCKER 1982
T
MALES N= 64
FEMALES N= 126
TOTAL N= 190
Ochre River
WHITE SUCKER 1982
U
MALES N= 334
FEMALES N= 389
TOTAL N= 723
Mink River
WHITE SUCKER 1982
V
MALES N= 525
FEMALES N= 532
TOTAL N= 1059
Mossy River
WHITE SUCKER 1982
W
MALES N= 378
FEMALES N= 384
TOTAL N= 758
Crooked Creek
WHITE SUCKER 1982
X
MALES N= 202
FEMALES N= 343
TOTAL N= 544
% FREQUENCY
LENGTH GROUP (mm)

Fig. 4. con't

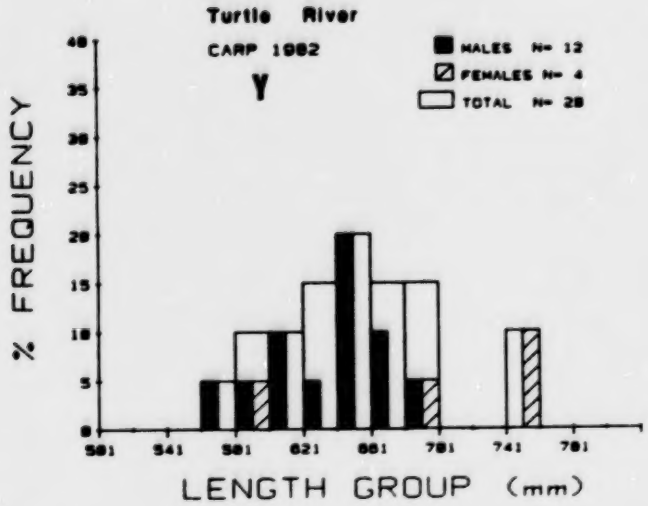

Fig. 4. Con't

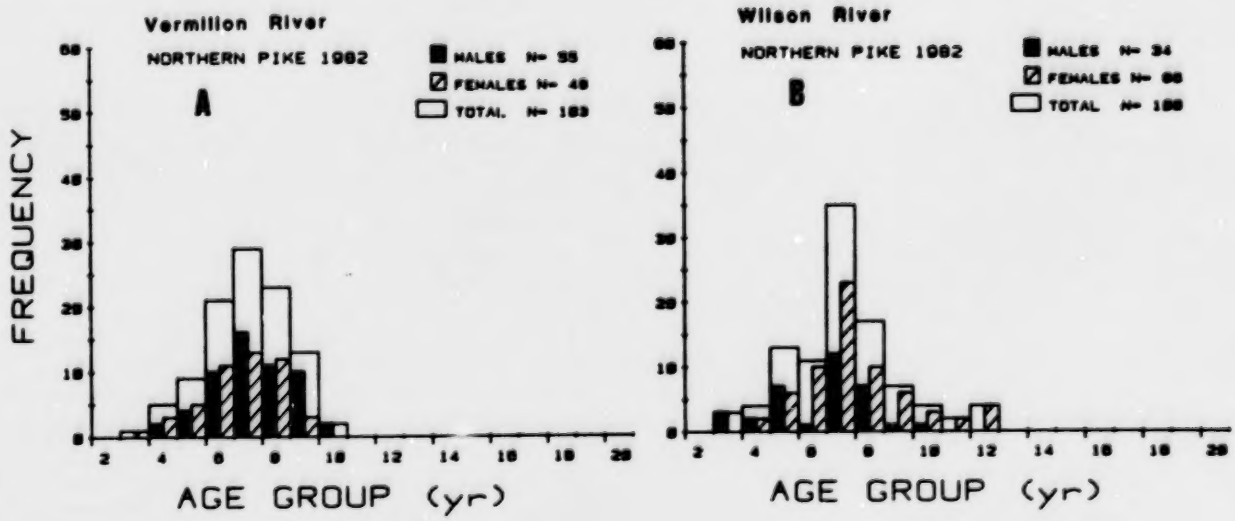

Fig. 5. Age-frequency distributions of various fish species from Dauphin Lake tributaries, 1982.

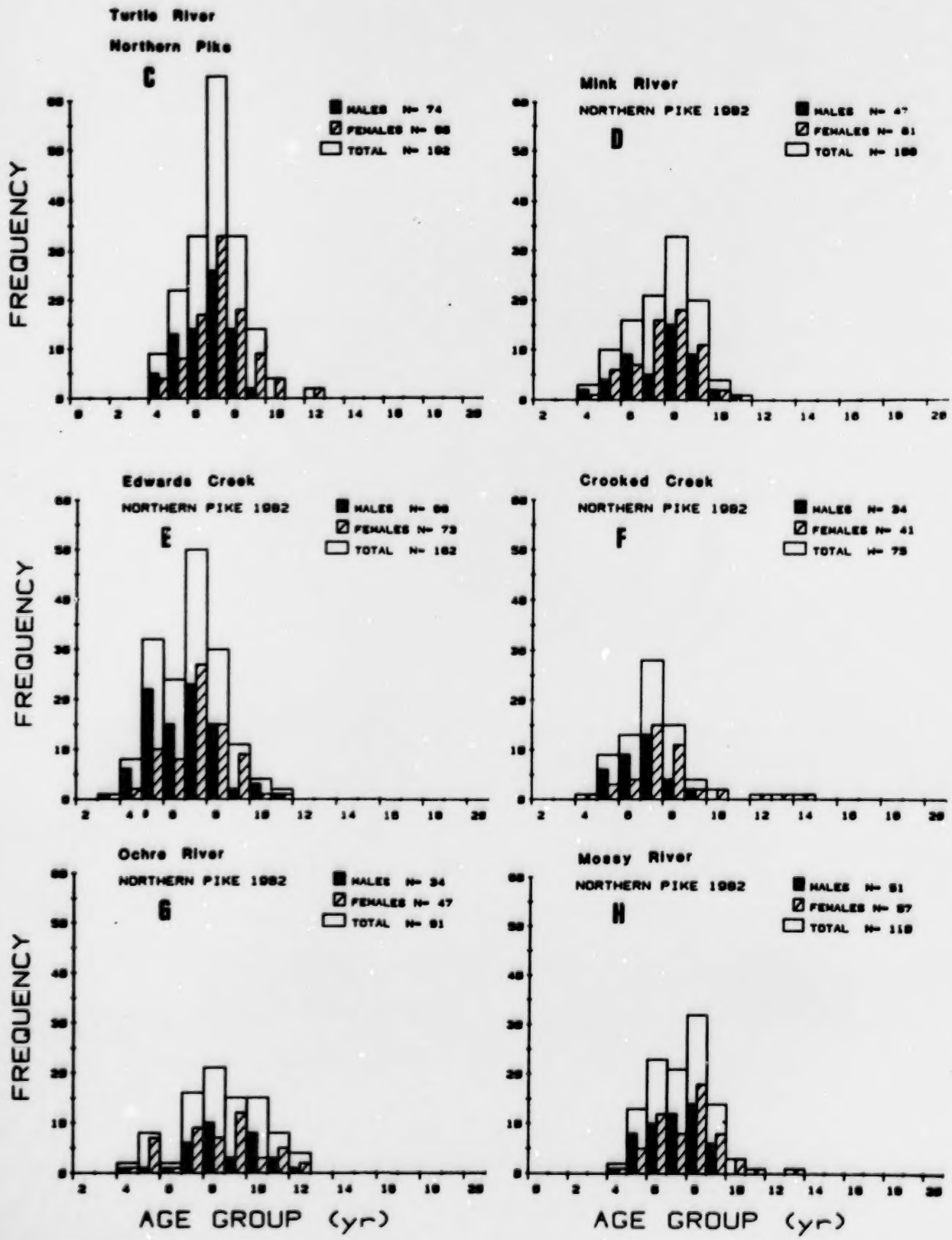
Turtle River
Northern Pike
C
MALES N= 74
FEMALES N= 88
TOTAL N= 162
Mink River
NORTHERN PIKE 1982
D
MALES N= 47
FEMALES N= 61
TOTAL N= 108
Edwards Creek
NORTHERN PIKE 1982
E
MALES N= 89
FEMALES N= 73
TOTAL N= 162
Crooked Creek
NORTHERN PIKE 1982
F
MALES N= 34
FEMALES N= 41
TOTAL N= 75
Ochre River
NORTHERN PIKE 1982
G
MALES N= 34
FEMALES N= 47
TOTAL N= 81
Mossy River
NORTHERN PIKE 1982
H
MALES N= 61
FEMALES N= 57
TOTAL N= 118
FREQUENCY
AGE GROUP (yr)

Fig. 5. Con't

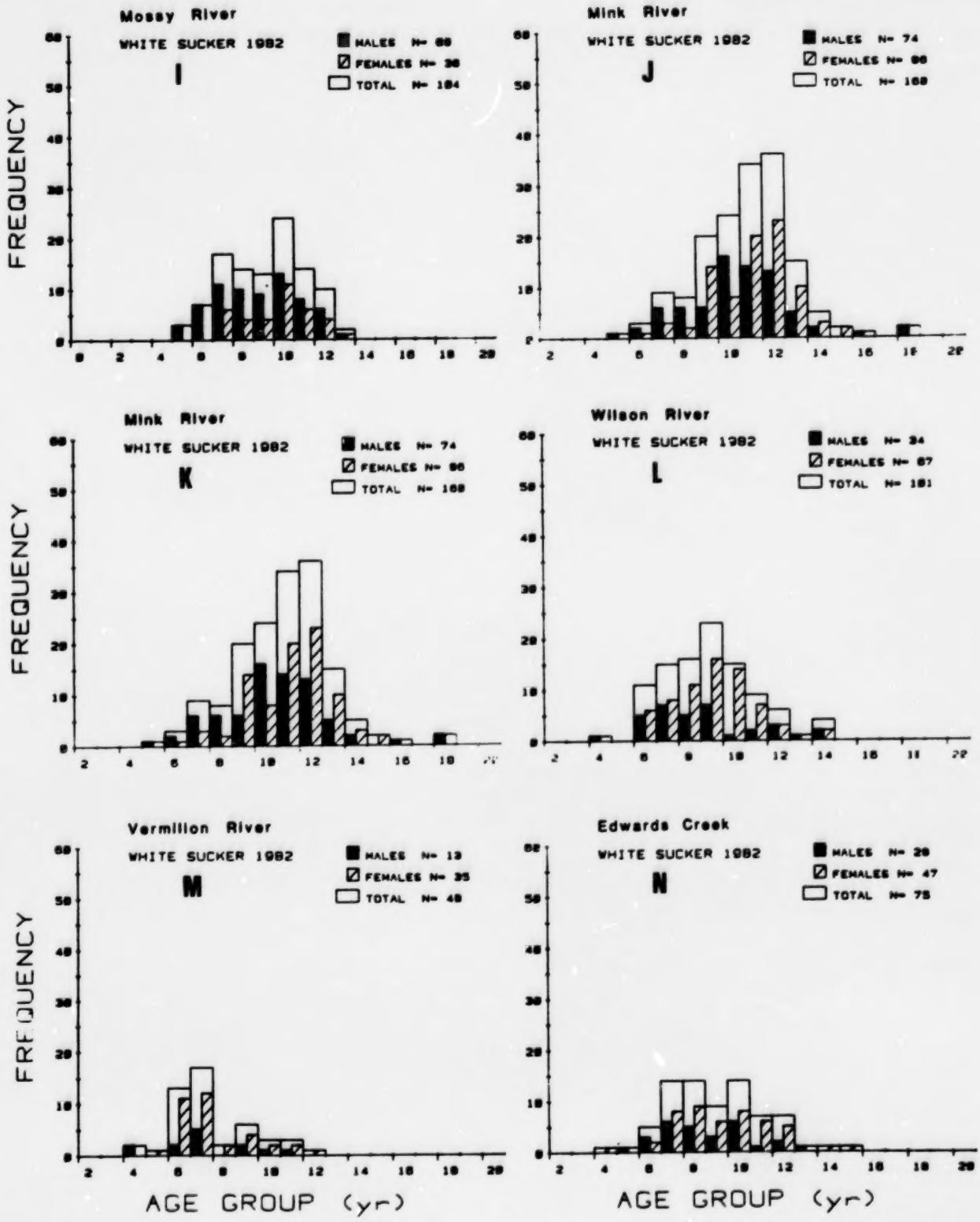
Mossy River
WHITE SUCKER 1982
I
MALES N= 88
FEMALES N= 36
TOTAL N= 184
Mink River
WHITE SUCKER 1982
J
MALES N= 74
FEMALES N= 86
TOTAL N= 160
Mink River
WHITE SUCKER 1982
K
MALES N= 74
FEMALES N= 86
TOTAL N= 160
Wilson River
WHITE SUCKER 1982
L
MALES N= 34
FEMALES N= 67
TOTAL N= 101
Vermilion River
WHITE SUCKER 1982
M
MALES N= 13
FEMALES N= 35
TOTAL N= 48
Edwards Creek
WHITE SUCKER 1982
N
MALES N= 28
FEMALES N= 47
TOTAL N= 75
FREQUENCY
AGE GROUP (yr)

Fig. 5. Con't

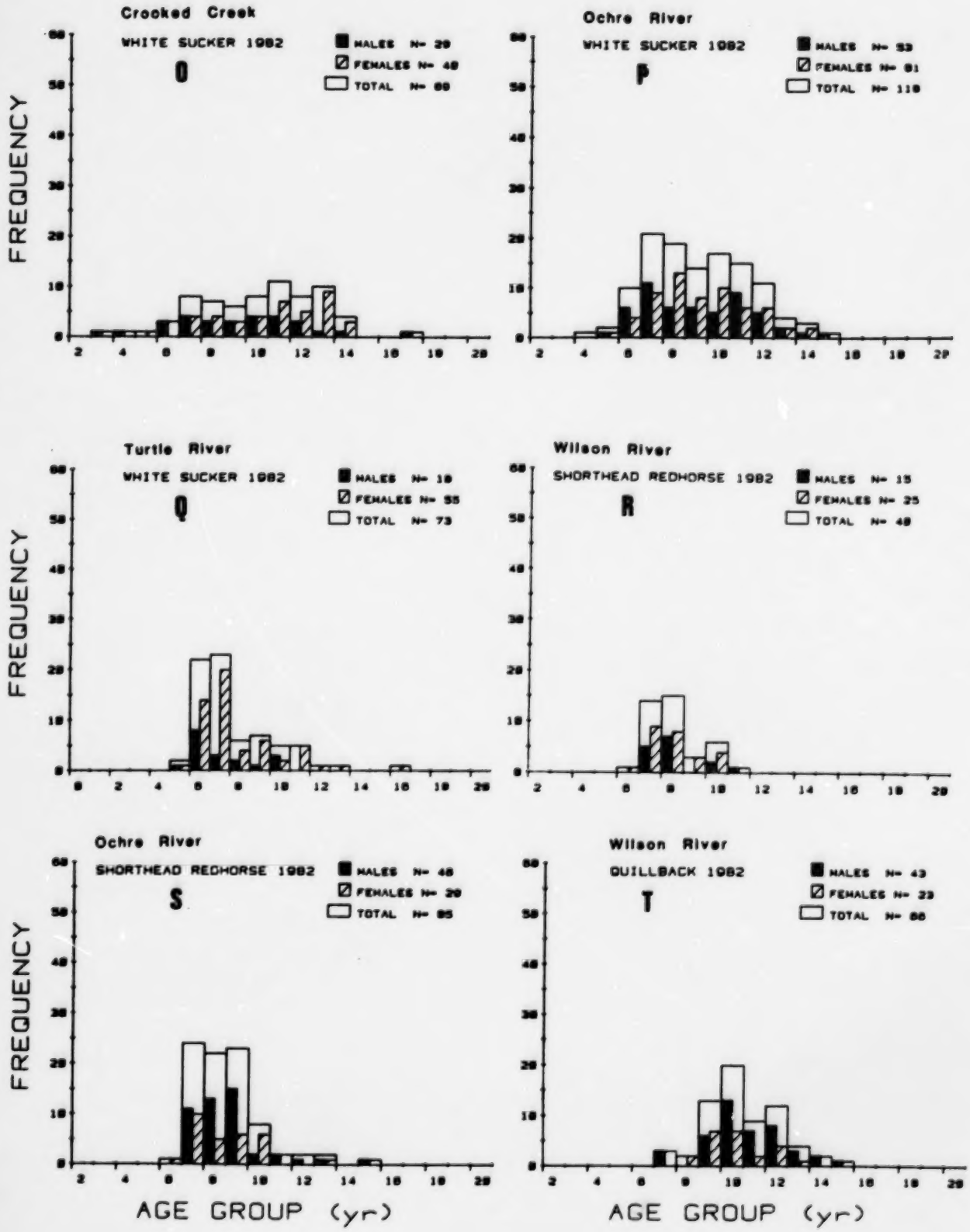
Crooked Creek
WHITE SUCKER 1982
Q
MALES N= 29
FEMALES N= 40
TOTAL N= 69
Ochre River
WHITE SUCKER 1982
P
MALES N= 53
FEMALES N= 61
TOTAL N= 114
Turtle River
WHITE SUCKER 1982
Q
MALES N= 18
FEMALES N= 55
TOTAL N= 73
Wilson River
SHORTHEAD REDHORSE 1982
R
MALES N= 15
FEMALES N= 25
TOTAL N= 40
Ochre River
SHORTHEAD REDHORSE 1982
S
MALES N= 48
FEMALES N= 29
TOTAL N= 85
Wilson River
QUILLBACK 1982
T
MALES N= 43
FEMALES N= 23
TOTAL N= 66
FREQUENCY
AGE GROUP (yr)

Fig. 5. Con't

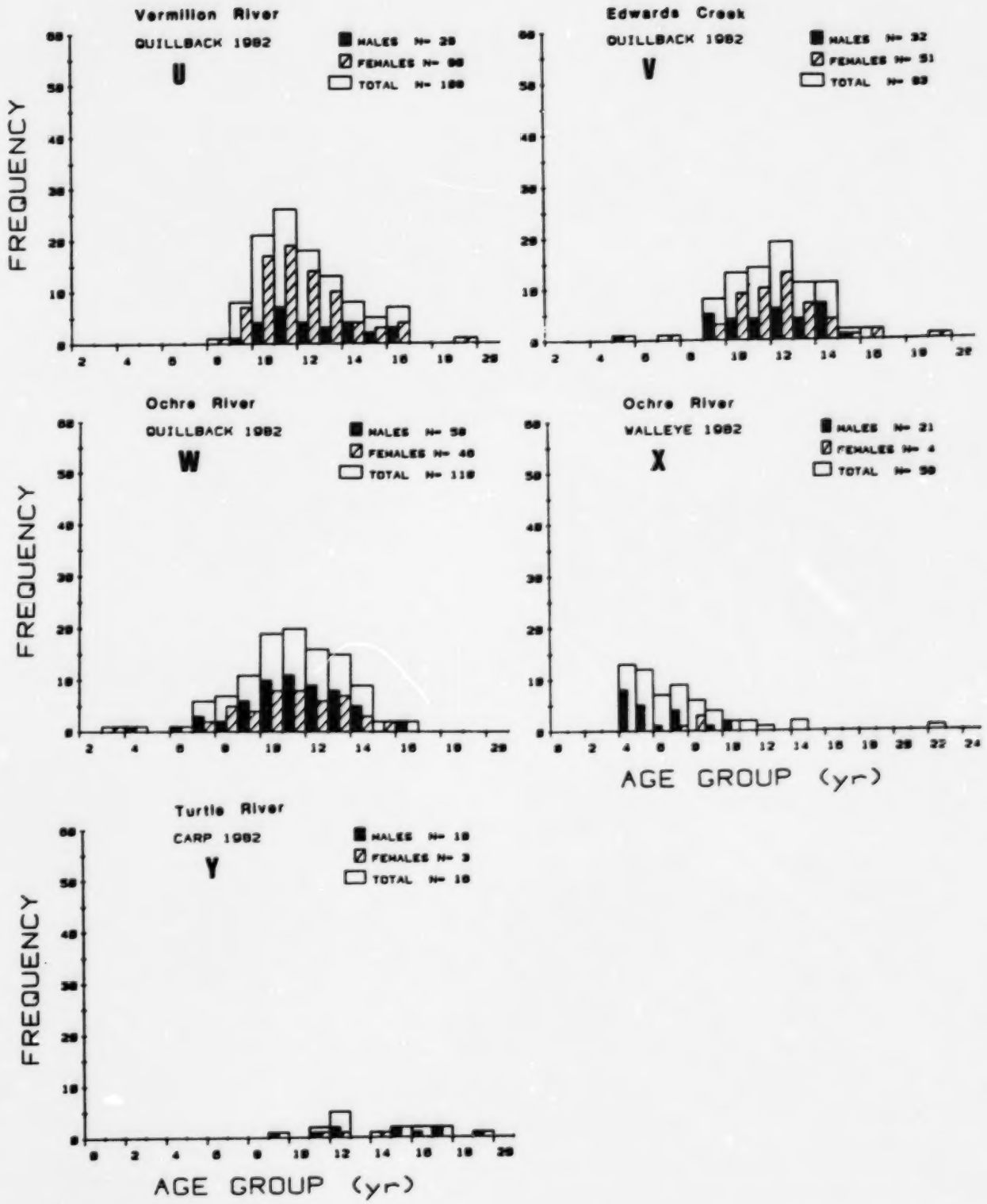
Vermilion River
QUILLBACK 1982
U
MALES N= 28
FEMALES N= 80
TOTAL N= 108
Edwards Creek
QUILLBACK 1982
V
MALES N= 32
FEMALES N= 51
TOTAL N= 83
Ochre River
QUILLBACK 1982
W
MALES N= 58
FEMALES N= 48
TOTAL N= 110
Ochre River
WALLEYE 1982
X
MALES N= 21
FEMALES N= 4
TOTAL N= 50
Turtle River
CARP 1982
Y
MALES N= 10
FEMALES N= 3
TOTAL N= 16
FREQUENCY
AGE GROUP (yr)

Fig. 5. Con't

Appendix 1. Stream water temperatures (°C) recorded in Dauphin Lake streams in spring, 1982.

LOCATION	VERMILION RIVER					OCHRE RIVER					CROOKED CREEK					WILSON RIVER				
	CONTINUOUS RECORDING			ROD TEMP		CONTINUOUS RECORDING			ROD TEMP		CONTINUOUS RECORDING			ROD TEMP		CONTINUOUS RECORDING			ROD TEMP	
DATE	MEAN	MAX.	MIN.	TIME	TEMP	MEAN	MAX.	MIN.	TIME	TEMP	MEAN	MAX.	MIN.	TIME	TEMP	MEAN	MAX.	MIN.	TIME	TEMP
24-APR-82											12.5	10.9	15.0	0900	13.0					
														1520	16.0					
25-APR-82									1158	3.0	10.3	12.5	8.6	0930	10.0				0830	8.0
																			1330	9.0
26-APR-82				900	4.0						8.9	12.5	6.0	0850	7.0					
														1750	13.0					
27-APR-82				930	5.0						9.6	12.9	6.0	1050	13.5				1100	10.0
28-APR-82				930	5.0						11.3	14.0	8.2	1030	9.5					10.0
														1700	15.0					
29-APR-82	7.3	9.2	6.7		7.0						9.6	13.0	9.0	0830	10.0					
														1780	10.0					
30-APR-82	7.1	7.8	6.3	830	6.5				1200	5.0	11.3	13.0	6.9	0900	7.0					9.0
														1800	14.0					
01-MAY-82	8.4	9.2	7.4								11.5	14.0	8.8	0930	9.5	9.8	10.8	8.8		12.0
														1800	15.0					
02-MAY-82	9.9	10.5	9.2		9.0						12.5	14.0	10.8	1030	11.5	10.6	11.2	10.0		11.0
														1515	15.0					
03-MAY-82	11.2	12.2	10.2		11.3						13.8	16.0	11.5	0930	12.5	12.2	12.8	11.4		15.0
														1800	17.0					
04-MAY-82	13.1	13.8	12.2		13.0				1400	15.0	14.4	16.8	13.0	0850	14.0	13.7	14.1	12.9		15.0
														1740	16.0					
05-MAY-82	12.5	13.0	11.8		13.0				1130	11.0	12.1	13.5	10.0	0900	11.0	12.6	13.0	11.6		14.0
														1400	13.0					
06-MAY-82	10.8	11.8	9.8		10.5						9.1	10.8	8.2	0910	9.0	10.9	11.8	9.5		11.0
07-MAY-82	8.6	9.8	8.0		8.0						7.0	8.4	6.0	0830	5.5	8.8	9.5	8.0		9.0
														1530	10.8					
08-MAY-82	7.8	8.5	7.4		7.0				1000	5.0	7.8	9.9	6.0			7.8	8.5	7.2		6.5
09-MAY-82	8.3	9.1	7.5		9.0				1100	7.0	9.2	10.5	7.5	0925	7.5	8.2	9.0	7.5		9.0
10-MAY-82	8.5	9.1	8.2		7.0				1300	7.0	8.0	10.3	7.0	0945	8.0	8.2	8.6	8.0		8.0
11-MAY-82	8.3	9.8	7.7		10.0				900	6.0	9.7	13.5	6.4	1650	13.5	7.6	8.8	7.1	1115	8.0
12-MAY-82	10.6	11.8	9.0		9.0				940	11.0	12.8	15.0	10.0	1730	12.0	10.1	11.7	8.5		11.5
13-MAY-82	12.7	13.5	11.4	900	12.0				1230	14.0	15.1	17.1	13.2	1430	18.0	12.2	13.5	11.2		12.5
14-MAY-82	14.7	16.1	13.5		14.0				1345	15.5	16.5	19.2	14.0	1530	19.0	14.0	15.0	12.8		15.0
15-MAY-82	15.0	15.8	14.5		14.0				1000	13.5	14.7	18.2	13.9	1130	15.0	14.0	15.2	13.8		14.0
16-MAY-82	13.0	14.5	12.5						925	10.0	11.3	12.8	11.0			12.4	14.9	11.7		
17-MAY-82	11.6	12.5	11.3		11.5		8.8	8.5			10.7	11.0	10.0			11.2	11.8	11.0		12.0
18-MAY-82	10.6	11.5	10.6		11.0	8.3	8.8	8.0	1130	9.0						10.5	11.0	10.2		11.5
19-MAY-82	10.2	10.7	10.1		10.0	8.4	8.7	8.2	1300	9.0										11.0
20-MAY-82	10.3	10.8	9.7		10.0	9.1	10.8	8.0	1000	8.0										
21-MAY-82						11.8	13.8	9.8	1030	11.0										
22-MAY-82						14.0	16.0	12.4												
23-MAY-82						15.2	16.9	13.4												
24-MAY-82						15.3	16.9	14.0												

Appendix 1. Continued. Stream water temperatures (°C) recorded in Dauphin Lake streams in spring, 1982.

LOCATION	VERMILION RIVER					OCHRE RIVER					CROOKED CREEK					WILSON RIVER				
	CONTINUOUS RECORDING			ROD TEMP		CONTINUOUS RECORDING			ROD TEMP		CONTINUOUS RECORDING			ROD TEMP		CONTINUOUS RECORDING			ROD TEMP	
DATE	MEAN	MAX.	MIN.	TIME	TEMP	MEAN	MAX.	MIN.	TIME	TEMP	MEAN	MAX.	MIN.	TIME	TEMP	MEAN	MAX.	MIN.	TIME	TEMP
25-MAY-82						16.5	19.1	14.0	1030	15.5										
26-MAY-82						18.6	21.0	15.5												
27-MAY-82						19.4	21.0	17.8												
28-MAY-82						17.0	19.8	16.0	1700	19.0										
29-MAY-82						13.6	15.0	12.8	1100	13.5										
30-MAY-82						11.9	13.0	11.2	1000	11.5										
31-MAY-82						9.7	10.5	9.3	1145	10.0										
01-JUN-82						14.0	16.0	12.4												
02-JUN-82						14.2	16.5	11.3												
03-JUN-82						15.2	17.5	12.8												
04-JUN-82						17.1	19.9	14.3												
05-JUN-82						18.2	19.6	16.8												
06-JUN-82						16.9	18.8	16.4												
07-JUN-82						14.5	15.3	13.0												
08-JUN-82						13.1	15.5	11.5												
09-JUN-82						13.8	15.9	11.7												
10-JUN-82						14.3	16.2	11.9												
11-JUN-82						15.8	18.0	13.5												
12-JUN-82						16.8	19.7	13.6												
13-JUN-82						17.1	19.0	15.4												
14-JUN-82						17.8	21.1	14.8												
15-JUN-82						17.8	20.8	15.2												
16-JUN-82						18.3	20.8	16.6												
17-JUN-82						15.3	17.2	14.4												
18-JUN-82						16.7	19.8	13.9												
19-JUN-82						16.4	18.0	15.6												
20-JUN-82						16.4	19.0	14.0												
21-JUN-82						17.5	20.5	14.8												
22-JUN-82						17.6	19.6	15.5												
23-JUN-82						18.1	20.2	16.4												
24-JUN-82						17.7	20.0	15.5												
25-JUN-82						17.9	20.0	15.4												
26-JUN-82						19.7	22.3	17.5												
27-JUN-82						19.4	21.8	16.9												
28-JUN-82								17.8												

Appendix 1. Continued. Stream water temperatures (°C) recorded in Dauphin Lake streams in spring, 1982.

LOCATION	MINK RIVER					EDWARDS CREEK					TURTLE RIVER					MOSSY RIVER				
	CONTINUOUS RECORDING			ROD TEMP		CONTINUOUS RECORDING			ROD TEMP		CONTINUOUS RECORDING			ROD TEMP		CONTINUOUS RECORDING			ROD TEMP	
DATE	MEAN	MAX.	MIN.	TIME	TEMP	MEAN	MAX.	MIN.	TIME	TEMP	MEAN	MAX.	MIN.	TIME	TEMP	MEAN	MAX.	MIN.	TIME	TEMP
23-APR-82				0915	10.0															
				1800	9.0															
24-APR-82				0845	10.0															
				1900	13.5															
25-APR-82				1000	8.0														1600	5.0
26-APR-82				1030	10.0				1130	3.0	7.5	9.1	5.9						1630	4.0
				1500	12.0				1800	7.5										
27-APR-82				0830	7.0				1145	5.0	8.0	9.5	6.4	0900	7.0				1110	5.0
									1930	10.0										
28-APR-82				0830	9.0				1200	8.5	9.2	10.8	7.9	1625	11.0				1030	5.0
									1830	12.5										
29-APR-82				0830	9.0				1100	9.0	8.8	10.0	8.4	0900	10.0				1000	5.0
									1900	7.5										
30-APR-82				0830	8.0				1000	6.0	8.7	10.5	7.0	0900	8.0				1000	4.0
									1900	12.5				1500	9.5					
01-MAY-82				0955	10.0				1100	9.0	9.6	11.4	7.9	1645	12.5				1040	6.0
									1830	14.0										
02-MAY-82				0900	10.0				1200	10.0	10.2	11.8	8.8	1100	9.5				1040	6.0
									1800	15.0				1700	12.5					
03-MAY-82				0845	12.0				1030	12.5	12.0	14.0	10.5	1030	12.0				1015	7.0
									1900	17.5										
04-MAY-82				0910	14.0				1045	12.0	12.8	13.8	12.0	1015	13.0				1010	8.0
									1815	17.0										
05-MAY-82				0915	9.0				1000	9.5	11.5	13.2	10.6						1005	7.5
									1845	11.0										
06-MAY-82				1700	9.0				1000	7.0	9.6	11.6	8.5						1120	6.0
									1800	8.0										
07-MAY-87				0900	7.0				1800	7.0	7.5	8.8	6.2						1050	5.0
08-MAY-82				0930	7.0				1600	9.0	6.8	7.5	6.0						1430	4.0
09-MAY-82				1000	9.0				1000	6.0	7.0	10.6	6.2						1100	6.0
10-MAY-82				0830	7.0				1015	6.0	6.6	7.5	6.1							5.0
11-MAY-82				0830	7.0				1700	10.5	7.3	9.5	5.6							5.0
12-MAY-82				1330	11.0				1800	14.5	9.5	11.5	8.0						1400	9.0
13-MAY-82				1330	15.0				2100	16.0	11.0	12.2	10.2	1130	12.0					11.0
14-MAY-82				1400	18.0				1800	19.0	12.8	14.3	11.8							14.0
15-MAY-82				1000	14.0				1100	12.0	12.6	14.3	2.2							12.5
16-MAY-82				0900	13.0				1030	9.0	11.2	12.2	10.9							
17-MAY-82				0900	11.0				0945	8.5	10.2	11.0	9.5							
18-MAY-82				1000	10.0						8.8	10.5	8.5							
19-MAY-82									1045	7.0	8.5	8.9	8.2							
20-MAY-82									1130	8.0	9.2	8.6	10.0							
21-MAY-82									0930	10.0	10.4	11.5	9.5							
22-MAY-82											12.5	14.0	11.2							
23-MAY-82											14.1	15.5	12.8							
24-MAY-82											15.2	16.0	14.5							
25-MAY-82									1000	15.0										
28-MAY-82									1730	13.5										

Appendix 2. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Vermillion River					**Species WALLEYE**							
361-380	1	380.00		100.00					1	380.00		100.00
Total	1								1			
Mean		380.00								380.00		
Min		380.00								380.00		
Max		380.00								380.00		
Stream Turtle River					**Species WALLEYE**							
401-420	1	412.00		50.00					1	412.00		50.00
541-560	1	552.00		50.00					1	552.00		50.00
Total	2								2			
Mean		482.00	98.99							482.00	98.99	
Min		412.00								412.00		
Max		552.00								552.00		
Stream Wilson River					**Species WALLEYE**							
401-420	3	407.00	6.24	100.00					3	407.00	6.24	100.00
Total	3								3			
Mean		407.00	6.24							407.00	6.24	
Min		402.00								402.00		
Max		414.00								414.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Vermilion River					**Species WALLEYE**							
361-380	1	380.00		100.00					1	380.00		100.00
Total	1								1			
Mean		380.00								380.00		
Min		380.00								380.00		
Max		380.00								380.00		
Stream Turtle River					**Species WALLEYE**							
401-420	1	412.00		50.00					1	412.00		50.00
541-560	1	552.00		50.00					1	552.00		50.00
Total	2								2			
Mean		482.00	98.99							482.00	98.99	
Min		412.00								412.00		
Max		552.00								552.00		
Stream Wilson River					**Species WALLEYE**							
401-420	3	407.00	6.24	100.00					3	407.00	6.24	100.00
Total	3								3			
Mean		407.00	6.24							407.00	6.24	
Min		402.00								402.00		
Max		414.00								414.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Ochre River					**Species WALLEYE**							
341-360									2	359.00	1.41	3.33
361-380	1	380.00		4.55					4	377.50	5.00	6.67
381-400	4	393.50	4.43	18.18					8	394.25	4.03	13.33
401-420	9	411.22	3.07	40.91					10	411.60	3.13	16.67
421-440									6	433.50	7.31	10.00
441-460									4	456.25	4.79	6.67
461-480	2	472.50	10.61	9.09					5	471.40	8.35	8.33
481-500	3	491.00	5.20	13.64	1	488.00		25.00	5	489.20	4.55	8.33
501-520	2	503.00	1.41	9.09	1	515.00		25.00	10	513.10	6.90	16.67
521-540	1	529.00		4.55	2	530.50	10.61	50.00	3	530.00	7.55	5.00
541-560									1	550.00		1.67
581-600									1	592.00		1.67
621-640									1	630.00		1.67
Total	22				4				60			
Mean		436.73	46.57			516.00	20.96			453.67	59.84	
Min		380.00				488.00				358.00		
Max		529.00				538.00				630.00		
Stream Crooked Creek					**Species WALLEYE**							
381-400	2	393.00	9.90	18.18					2	393.00	9.90	15.38
401-420	4	406.50	4.20	36.36					4	406.50	4.20	30.77
421-440	1	422.00		9.09					1	422.00		7.69
481-500	1	491.00		9.09	1	492.00		50.00	2	491.50	0.71	15.38
501-520	2	510.50	4.95	18.18	1	508.00		50.00	3	509.67	3.79	23.08
521-540	1	523.00		9.09					1	523.00		7.69
Total	11				2				13			
Mean		442.64	53.63			500.00	11.31			451.46	53.59	
Min		386.00				492.00				386.00		
Max		523.00				508.00				523.00		
Stream Mink River					**Species WALLEYE**							
341-360	1	355.00		25.00	1	349.00		33.33	2	352.00	4.24	28.57
401-420	2	410.00	5.66	50.00					2	410.00	5.66	28.57
421-440	1	438.00		25.00					1	438.00		14.29
541-560					2	552.50	10.61	66.67	2	552.50	10.61	28.57
Total	4				3				7			
Mean		403.25	34.92			484.67	117.70			438.14	84.40	
Min		355.00				349.00				349.00		
Max		438.00				560.00				560.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Vermilion River					Species QUILLBACK							
221-240					1	225.00		0.53	1	225.00		0.39
341-360					1	357.00		0.53	1	357.00		0.39
361-380	9	372.44	7.89	13.04	2	374.00	7.07	1.06	11	372.73	7.43	4.28
381-400	20	394.65	4.25	28.99	12	393.00	6.38	6.38	32	394.03	5.11	12.45
401-420	21	409.48	5.61	30.43	38	412.68	4.75	20.21	59	411.54	5.26	22.96
421-440	12	429.50	5.07	17.39	67	431.04	5.40	35.64	79	430.81	5.35	30.74
441-460	2	449.50	6.36	2.90	37	449.35	5.33	19.68	39	449.36	5.29	15.18
461-480	1	461.00		1.45	10	471.00	5.01	5.32	11	470.09	5.63	4.28
481-500					12	489.33	6.23	6.38	12	489.33	6.23	4.67
501-520	2	517.00		2.90	7	506.86	6.39	3.72	9	509.11	7.11	3.50
521-540	1	529.00		1.45	1	532.00		0.53	2	530.50	2.12	0.78
541-560	1	555.00		1.45					1	555.00		0.39
Total	69				188				257			
Mean		412.70	35.78			435.62	33.14			429.46	35.30	
Min		361.00				225.00				225.00		
Max		555.00				532.00				555.00		
Stream Wilson River					Species QUILLBACK							
321-340	1	336.00		1.89					1	336.00		1.20
341-360	1	355.00		1.89					1	355.00		1.20
361-380	5	377.00	4.64	9.43					5	377.00	4.64	6.02
381-400	19	391.53	4.53	35.85	1	396.00		3.33	20	391.75	4.52	24.10
401-420	10	411.20	6.66	18.87	4	415.75	5.97	13.33	14	412.50	6.60	16.87
421-440	7	427.57	4.43	13.21	13	432.23	5.36	43.33	20	430.60	5.43	21.10
441-460	7	449.29	7.61	13.21	8	448.50	5.21	26.67	15	448.87	6.21	18.07
461-480	1	473.00		1.89	1	463.00		3.33	2	468.00	7.07	2.41
481-500	2	488.50	4.95	3.77	1	483.00		3.33	3	486.67	4.73	3.61
501-520					2	511.50	3.54	6.67	2	511.50	3.54	2.41
Total	53				30				83			
Mean		409.72	31.33			441.17	25.51			421.08	32.92	
Min		336.00				396.00				336.00		
Max		492.00				514.00				514.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Ochre River					**Species QUILLBACK**							
281-300	2	287.00	4.24	0.68					2	287.00	4.24	0.35
301-320	1	317.00		0.34					1	317.00		0.17
321-340	2	337.50	0.71	0.68					2	337.50	0.71	0.35
341-360	2	358.00	1.41	0.68	1	359.00		0.37	4	356.25	4.27	0.70
361-380	34	373.79	5.42	11.56	6	376.50	2.88	2.22	42	374.14	5.29	7.32
381-400	106	391.14	5.32	36.05	28	393.46	5.24	10.37	135	391.68	5.38	23.52
401-420	70	410.10	5.61	23.81	77	411.94	5.58	28.52	149	411.08	5.68	25.96
421-440	32	427.53	5.68	10.88	89	430.99	5.95	32.96	125	430.23	6.07	21.78
441-460	29	451.62	6.64	9.86	34	449.18	5.28	12.59	63	450.30	6.02	10.98
461-480	14	468.29	3.05	4.76	10	470.50	5.04	3.70	24	469.21	4.05	4.18
481-500	2	490.00	11.31	0.68	13	488.23	5.92	4.81	15	488.47	6.29	2.61
501-520					10	509.30	4.47	3.70	10	509.30	4.47	1.74
521-540					2	526.50	2.12	0.74	2	526.50	2.12	0.35
Total	294				270				574			
Mean		406.37	29.92			430.30	30.32			417.62	32.38	
Min		284.00				359.00				284.00		
Max		498.00				528.00				528.00		
Stream Edwards Creek					**Species QUILLBACK**							
281-300	1	294.00		1.49					1	294.00		0.70
341-360	2	350.00	9.90	2.99					2	350.00	9.90	1.40
361-380	11	373.09	6.86	16.42	1	374.00		1.32	12	373.17	6.55	8.39
381-400	30	391.33	5.29	44.78	9	392.56	6.78	11.84	39	391.62	5.59	27.27
401-420	10	409.10	6.59	14.93	21	413.71	5.77	27.63	31	412.23	6.33	21.68
421-440	4	432.00	7.30	5.97	19	429.79	5.42	25.00	23	430.17	5.66	16.08
441-460	5	452.80	7.09	7.46	12	452.67	6.18	15.79	17	452.71	6.23	11.89
461-480	3	467.00	2.65	4.48	8	470.50	5.26	10.53	11	469.55	4.84	7.69
481-500	1	489.00		1.49	4	488.25	4.03	5.26	5	488.40	3.51	3.50
501-520					1	510.00		1.32	1	510.00		0.70
521-540					1	527.00		1.32	1	527.00		0.70
Total	67				76				143			
Mean		400.16	32.30			433.51	30.83			417.89	35.58	
Min		294.00				374.00				294.00		
Max		489.00				527.00				527.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Turtle River					**Species QUILLBACK**							
401-420	1	407.00		100.00					2	408.00	1.41	50.00
421-440									1	433.00		25.00
441-460									1	441.00		25.00
Total	1								4			
Mean		407.00								422.50	17.08	
Min		407.00								407.00		
Max		407.00								441.00		
Stream Turtle river					**Species SHORTHEAD REDHORSE**							
321-340	1	328.00		33.33	1	334.00		20.00	2	331.00	4.24	22.22
341-360	1	352.00		33.33					1	352.00		11.11
361-380					2	371.00	8.49	40.00	3	369.00	6.93	33.33
381-400					1	382.00		20.00	1	382.00		11.11
401-420	1	416.00		33.33					1	416.00		11.11
421-440					1	426.00		20.00	1	426.00		11.11
Total	3				5				9			
Mean		365.33	45.49			376.80	33.24			371.67	33.27	
Min		328.00				334.00				328.00		
Max		416.00				426.00				426.00		
Stream Edwards Creek					**Species SHORTHEAD REDHORSE**							
321-340	1	335.00		33.33					1	335.00		20.00
341-360					1	355.00		50.00	1	355.00		20.00
361-380	2	364.00	1.41	66.67	1	379.00		50.00	3	369.00	8.72	60.00
Total	3				2				5			
Mean		354.33	16.77			367.00	16.97			359.40	16.15	
Min		335.00				355.00				335.00		
Max		365.00				379.00				379.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

	length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
		N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream	Ochre River					Species	SHORTHEAD REDHORSE						
	301-320	1	320.00		2.04	3	317.67	1.53	9.68	4	318.25	1.71	4.44
	321-340	13	331.85	4.08	26.53	1	333.00		3.23	17	331.24	4.16	18.89
	341-360	21	350.24	5.29	42.86	8	353.13	6.03	25.81	32	351.25	5.39	35.56
	361-380	10	369.60	6.96	20.41	11	369.27	5.83	35.48	25	369.44	6.15	27.78
	381-400	3	390.00	7.21	6.12	2	383.50	2.12	6.45	5	387.40	6.31	5.56
	401-420	1	403.00		2.04	5	406.20	1.64	16.13	6	405.67	1.97	6.67
	421-440					1	428.00		3.23	1	428.00		1.11
	Total	49				31				90			
	Mean		352.30	19.20			367.00	27.45			357.54	23.31	
	Min		320.00				316.00				316.00		
	Max		403.00				428.00				428.00		
Stream	Vermilion River					Species	SHORTHEAD REDHORSE						
	341-360					2	348.50	10.61	66.67	2	348.50	10.61	66.67
	401-420					1	407.00		33.33	1	407.00		33.33
	Total					3				3			
	Mean						368.00	34.60			368.00	34.60	
	Min						341.00				341.00		
	Max						407.00				407.00		
Stream	Wilson River					Species	SHORTHEAD REDHORSE						
	321-340	7	333.71	5.77	43.75	5	332.60	4.22	17.86	12	333.25	4.99	27.27
	341-360	1	360.00		6.25	9	350.89	6.70	32.14	10	351.80	6.94	22.73
	361-380	5	373.00	4.80	31.25	3	365.33	5.86	10.71	8	370.13	6.22	18.18
	381-400	3	388.33	8.39	18.75	4	390.50	7.59	14.29	7	389.57	7.32	15.91
	401-420					2	407.00		7.14	2	407.00		4.55
	421-440					2	432.00	2.83	7.14	2	432.00	2.83	4.55
	441-460					3	452.00	3.46	10.71	3	452.00	3.46	6.82
	Total	16				28				44			
	Mean		357.88	23.73			375.46	39.67			369.07	35.47	
	Min		327.00				330.00				327.00		
	Max		398.00				454.00				454.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Mink Creek					**Species SHORTHEAD REDHORSE**							
301-320									1	303.00		11.11
321-340					2	330.00		50.00	3	333.33	5.77	33.33
341-360									1	345.00		11.11
361-380					1	377.00		25.00	2	372.50	6.36	22.22
421-440					1	430.00		25.00	2	433.00	4.24	22.22
Total					4				9			
Mean						366.75	47.63			362.11	45.64	
Min						330.00				303.00		
Max						430.00				436.00		
Stream Turtle River					**Species WHITE SUCKER**							
341-360	2	353.50	4.95	3.23					2	353.50	4.95	0.97
361-380	10	371.50	6.31	16.13	3	376.67	1.15	2.08	13	372.69	5.94	6.31
381-400	24	390.38	5.40	38.71	10	391.40	6.02	6.94	34	390.68	5.51	16.50
401-420	19	408.95	5.63	30.65	39	411.92	5.67	27.08	58	410.95	5.78	28.16
421-440	3	424.33	2.08	4.84	47	431.72	5.46	32.64	50	431.28	5.59	24.27
441-460	3	443.00	1.00	4.84	38	446.61	4.68	26.39	41	446.34	4.61	19.90
461-480	1	465.00		1.61	7	466.71	7.76	4.86	8	466.50	7.21	3.88
Total	62				144				206			
Mean		397.23	21.77			428.04	20.44			418.77	25.17	
Min		350.00				376.00				350.00		
Max		465.00				478.00				478.00		
Stream Vermilion River					**Species WHITE SUCKER**							
321-340					1	335.00		2.04	1	335.00		1.43
341-360	1	355.00		4.76					1	355.00		1.43
361-380	1	368.00		4.76					1	368.00		1.43
381-400	4	390.25	5.12	19.05	2	389.50	0.71	4.08	6	390.00	4.00	8.57
401-420	11	414.36	6.15	52.38	6	413.17	6.43	12.24	17	413.94	6.08	24.29
421-440	4	434.25	4.35	19.05	14	431.79	5.60	28.57	18	432.33	5.34	25.71
441-460					19	448.42	4.83	38.78	19	448.42	4.83	27.14
461-480					5	467.60	2.88	10.20	5	467.60	2.88	7.14
481-500					2	485.00	1.41	4.08	2	485.00	1.41	2.86
Total	21				49				70			
Mean		408.52	21.66			438.08	25.61			429.21	27.90	
Min		355.00				335.00				335.00		
Max		438.00				486.00				486.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Crooked Creek					Species WHITE SUCKER							
321-340	2	337.50	3.54	1.00					2	337.50	3.54	0.37
361-380	22	374.32	4.59	11.00	6	371.83	6.31	1.75	28	373.79	4.98	5.15
381-400	60	391.23	5.71	30.00	23	392.43	6.65	6.71	83	391.57	5.97	15.26
401-420	89	409.70	5.39	44.50	66	412.41	5.57	19.24	156	410.83	5.60	28.68
421-440	20	428.60	6.13	10.00	125	432.10	5.49	36.44	145	431.61	5.69	26.65
441-460	3	452.67	6.81	1.50	81	449.38	6.20	23.62	84	449.50	6.21	15.44
461-480	1	475.00		0.50	34	467.74	4.22	9.91	35	467.94	4.33	6.43
481-500	3	493.67	5.86	1.50	8	487.63	5.80	2.33	11	489.27	6.20	2.02
Total	200				343				544			
Mean		403.66	21.86			433.50	23.30			422.49	26.92	
Min		335.00				363.00				335.00		
Max		498.00				499.00				499.00		
Stream Wilson River					Species WHITE SUCKER							
321-340	1	330.00		1.56					1	330.00		0.53
341-360	1	354.00		1.56					1	354.00		0.53
361-380	4	375.50	7.68	6.25	1	368.00		0.79	5	374.00	7.45	2.63
381-400	17	391.47	5.57	26.56	3	396.67	3.21	2.38	20	392.25	5.55	10.53
401-420	22	408.82	5.40	34.38	20	411.70	4.78	15.87	42	410.19	5.26	22.11
421-440	12	432.83	4.41	18.75	34	431.85	5.08	26.98	46	432.11	4.89	24.21
441-460	4	450.50	6.56	6.25	38	451.39	4.96	30.16	42	451.31	5.03	22.11
461-480	2	473.00	4.24	3.13	21	468.38	6.57	16.67	23	468.78	6.47	12.11
481-500	1	484.00		1.56	7	488.86	5.27	5.56	8	488.25	5.18	4.21
501-520					2	511.00	1.41	1.59	2	511.00	1.41	1.05
Total	64				126				190			
Mean		410.33	27.61			432.47	25.18			432.47	30.39	
Min		330.00				368.00				330.00		
Max		484.00				512.00				512.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Mink River					Species WHITE SUCKER							
281-300									1	288.00		0.09
321-340	1	331.00		0.19	1	331.00		0.19	2	331.00		0.19
341-360	6	353.00	4.82	1.14	1	352.00		0.19	8	352.88	4.09	0.76
361-380	80	373.64	5.59	15.24	4	374.25	6.45	0.75	84	373.67	5.59	7.93
381-400	205	391.67	6.21	39.05	24	390.17	5.11	4.51	229	391.52	6.12	21.62
401-420	166	409.24	5.52	31.62	99	413.21	5.94	18.61	265	410.72	5.98	25.02
421-440	52	427.85	5.46	9.90	175	431.61	5.71	32.89	227	430.74	5.86	21.44
441-460	12	448.08	5.07	2.29	167	449.90	5.84	31.39	179	449.78	5.80	16.90
461-480	1	471.00		0.19	52	467.58	5.60	9.77	53	467.64	5.56	5.00
481-500	2	493.50	0.71	0.38	9	487.89	3.79	1.69	11	488.91	4.09	1.04
Total	525				532				1059			
Mean		399.33	20.00			435.75	22.30			417.48	28.26	
Min		331.00				331.00				288.00		
Max		494.00				494.00				494.00		
Stream Edwards Creek					Species WHITE SUCKER							
321-340	1	335.00		0.95					1	335.00		0.45
341-360	6	357.83	3.25	5.71					6	357.83	3.25	2.68
361-380	30	372.83	5.10	28.57	6	370.83	5.78	5.04	36	372.50	5.19	16.07
381-400	25	389.32	5.13	23.81	19	392.63	4.95	15.97	44	390.75	5.26	19.64
401-420	26	409.58	5.49	24.76	30	411.70	6.47	25.21	56	410.71	6.07	25.00
421-440	15	427.40	5.45	14.29	32	429.44	5.42	26.89	47	428.79	5.45	20.98
441-460	1	441.00		0.95	29	449.69	5.71	24.37	30	449.40	5.83	13.39
461-480					3	466.33	5.86	2.52	3	466.33	5.86	1.34
481-500	1	487.00		0.95					1	487.00		0.45
Total	105				119				224			
Mean		394.17	24.38			422.00	24.16			408.96	27.93	
Min		335.00				364.00				335.00		
Max		487.00				473.00				487.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Ochre River					Species WHITE SUCKER							
281-300	1	297.00		0.30					1	297.00		0.14
301-320	2	314.00	8.49	0.60					2	314.00	8.49	0.28
321-340	4	338.00	1.63	1.20					4	338.00	1.63	0.56
341-360	14	355.00	6.18	4.19	1	353.00		0.27	16	355.31	5.91	2.26
361-380	73	372.59	5.55	21.88	8	371.38	7.58	2.17	82	372.55	5.75	11.57
381-400	112	390.75	6.06	33.53	50	392.88	5.35	13.55	162	391.41	5.92	22.85
401-420	81	410.15	5.94	24.25	89	411.24	5.73	24.12	172	410.78	5.85	24.26
421-440	34	428.74	5.00	10.18	124	430.36	5.57	33.60	159	430.06	5.49	22.43
441-460	9	448.67	5.50	2.69	74	448.82	4.99	20.05	84	448.81	4.98	11.85
461-480	4	468.25	7.09	1.20	19	467.37	4.73	5.15	23	467.52	5.03	3.24
481-500					4	490.50	6.95	1.08	4	490.50	6.95	0.56
Total	334				369				709			
Mean		394.98	25.25			425.44	23.56			410.95	28.75	
Min		297.00				353.00				297.00		
Max		478.00				499.00				499.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)		
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD
Stream Turtle River					Species NORTHERN PIKE						
341-360	4	348.00	3.37	0.37	2	355.50	6.36	0.21	6	350.50	5.47
361-380	16	371.19	6.49	1.49	11	372.18	5.31	1.18	29	371.45	5.80
381-400	26	389.62	6.09	2.42	27	390.74	5.25	2.90	53	390.19	5.65
401-420	41	410.34	6.02	3.82	60	411.07	6.18	6.44	101	410.77	6.09
421-440	63	430.30	5.28	5.87	69	430.90	5.55	7.40	133	430.62	5.39
441-460	130	451.76	5.39	12.12	67	449.76	5.53	7.19	201	451.07	5.51
461-480	185	471.04	5.57	17.24	88	471.15	5.47	9.44	279	470.96	5.57
481-500	245	489.93	5.62	22.83	166	491.26	5.76	17.81	414	490.48	5.70
501-520	166	510.38	5.68	15.47	148	510.05	5.98	15.88	317	510.21	5.81
521-540	100	529.06	5.29	9.32	115	529.25	5.83	12.34	216	529.18	5.57
541-560	60	548.90	6.20	5.59	65	550.09	5.56	6.97	127	549.59	5.91
561-580	23	569.96	6.02	2.14	45	568.89	5.40	4.83	69	569.26	5.56
581-600	9	588.11	6.21	0.84	35	590.71	5.50	3.76	44	590.18	5.68
601-620	4	613.25	4.72	0.37	11	608.55	5.37	1.18	16	609.50	5.43
621-640	1	623.00		0.09	8	627.75	3.65	0.86	9	627.22	3.77
641-660					3	654.00	2.65	0.32	3	654.00	2.65
661-680					3	671.00	8.54	0.32	3	671.00	8.54
681-700					1	698.00		0.11	1	698.00	
721-740					2	733.00	1.41	0.21	2	733.00	1.41
741-760					1	744.00		0.11	1	744.00	
761-780					1	770.00		0.11	1	770.00	
861-880					1	870.00		0.11	1	870.00	
881-900									1	898.00	
901-Max					3	936.67	34.15	0.32	3	936.67	34.15
Total	1073				932				2030		
Mean		484.01	43.69			498.20	64.04			490.71	55.30
Min		346.00				351.00				346.00	
Max		623.00				974.00				974.00	

Appendix 2. Con't Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Ochre River					Species NORTHERN PIKE							
321-340	1	340.00		1.00					1	340.00		0.37
341-360	1	350.00		1.00	1	354.00		0.63	2	352.00	2.83	0.73
361-380	4	372.50	2.08	4.00					4	372.50	2.08	1.47
381-400	4	393.50	6.45	4.00	4	394.75	6.18	2.52	8	394.13	5.89	2.93
401-420	8	414.38	5.88	8.00	17	410.53	4.74	10.69	25	411.76	5.33	9.16
421-440	3	434.00	8.66	3.00	10	432.80	6.88	6.29	13	433.08	6.95	4.76
441-460	21	453.33	5.51	21.00	6	451.83	7.52	3.77	28	453.07	5.79	10.26
461-480	18	473.78	5.14	18.00	19	469.84	6.69	11.95	39	472.00	6.21	14.29
481-500	23	491.74	5.81	23.00	25	492.56	5.81	15.72	49	492.02	5.79	17.95
501-520	10	506.10	4.38	10.00	36	510.50	4.88	22.64	49	509.43	4.96	17.95
521-540	3	531.00	7.81	3.00	22	530.41	4.85	13.84	29	530.17	5.06	10.62
541-560	2	550.00		2.00	13	547.92	6.02	8.18	18	548.61	5.88	6.59
561-580	1	565.00		1.00	3	563.67	2.89	1.89	4	564.00	2.45	1.47
581-600	1	582.00		1.00					1	582.00		0.37
601-620					1	602.00		0.63	1	602.00		0.37
621-640					1	625.00		0.63	1	625.00		0.37
681-700					1	700.00		0.63	1	700.00		0.37
Total	100				159				273			
Mean		466.30	44.74			490.44	50.43			482.75	49.32	
Min		340.00				354.00				340.00		
Max		582.00				700.00				700.00		
Stream Bennet Drain					Species NORTHERN PIKE							
341-360	2	346.00	4.24	3.33					2	346.00	4.24	7.69
361-380					1	370.00		5.26	1	370.00		3.85
381-400					1	399.00		5.26	1	399.00		3.85
401-420					2	417.00	4.24	10.53	3	415.33	4.16	11.54
421-440					2	423.50	0.71	10.53	2	423.50	0.71	7.69
441-460	1	454.00		16.67	4	451.75	6.70	21.05	5	452.20	5.89	19.23
461-480					2	469.50	7.78	10.53	2	469.50	7.78	7.69
481-500	2	484.00	1.41	33.33	3	493.00	7.55	15.79	5	489.40	7.30	19.23
501-520					4	508.50	5.80	21.05	4	508.50	5.80	15.38
521-540	1	525.00		16.67					1	525.00		3.85
Total	6				19				26			
Mean		439.83	76.14			458.37	41.96			452.31	50.57	
Min		343.00				370.00				343.00		
Max		525.00				517.00				525.00		

Appendix 2. Con't Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Edwards Creek					Species NORTHERN PIKE							
281-300	1	292.00		0.09					1	292.00		0.05
301-320	1	305.00		0.09					1	305.00		0.05
321-340	3	331.33	5.69	0.27					4	329.50	5.92	0.20
341-360	24	353.75	4.97	2.15	3	357.33	2.52	0.33	27	354.15	4.87	1.33
361-380	91	371.00	5.68	8.15	14	373.14	5.50	1.55	106	371.36	5.70	5.21
381-400	115	390.65	5.46	10.30	42	391.64	5.72	4.56	157	390.92	5.53	7.71
401-420	98	410.52	6.06	8.77	84	411.05	5.31	9.29	184	410.81	5.73	9.04
421-440	82	432.65	5.69	7.34	101	430.51	5.77	11.17	184	431.45	5.81	9.04
441-460	118	451.42	5.63	10.56	78	450.55	5.71	8.63	199	451.03	5.70	9.78
461-480	193	471.53	5.48	17.28	97	471.53	5.84	10.73	292	471.51	5.58	14.35
481-500	169	490.28	5.92	15.13	130	490.97	5.61	14.38	299	490.58	5.79	14.69
501-520	126	509.54	6.10	11.28	148	510.53	5.58	16.37	274	510.08	5.83	13.52
521-540	55	529.09	4.95	4.92	97	531.00	5.85	10.73	153	530.31	5.58	7.52
541-560	23	550.17	5.71	2.06	53	549.38	5.22	5.86	77	549.70	5.36	3.78
561-580	9	569.67	6.86	0.81	23	568.78	5.67	2.54	33	568.82	5.96	1.62
581-600	4	587.75	3.86	0.36	13	589.54	4.54	1.44	18	589.67	4.81	0.88
601-620	2	616.00	5.66	0.18	15	609.40	5.17	1.66	17	610.18	5.49	0.84
621-640					3	631.33	6.35	0.33	3	631.33	6.35	0.15
641-660	1	650.00		0.09	1	649.00		0.11	2	649.50	0.71	0.10
661-680					1	676.00		0.11	1	676.00		0.05
681-700	1	695.00		0.09					1	695.00		0.05
861-880	1	880.00		0.09					1	880.00		0.05
901-Max					1	917.00		0.11	1	917.00		0.05
Total	1117				904				2035			
Mean		456.52	70.85			481.93	56.23			467.86	65.98	
Min		292.00				355.00				292.00		
Max		880.00				917.00				917.00		

Appendix 2. Con't Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Vermilion River					Species NORTHERN PIKE							
301-320	1	305.00		0.16					1	305.00		0.09
341-360	3	350.67	2.08	0.47	2	350.50	0.71	0.40	6	352.17	4.07	0.52
361-380	19	373.74	5.30	2.95	3	378.67	2.31	0.59	22	374.41	5.25	1.91
381-400	24	391.42	5.29	3.73	19	392.85	6.16	3.76	43	392.09	5.67	3.74
401-420	34	410.24	5.96	5.29	29	411.48	6.71	5.74	63	410.81	6.30	5.48
421-440	31	431.39	5.40	4.82	42	430.45	5.71	8.32	73	430.85	5.56	6.35
441-460	67	452.00	5.74	10.42	45	449.04	5.60	8.91	112	450.81	5.84	9.74
461-480	110	470.95	5.54	17.11	36	470.56	6.12	7.13	146	470.86	5.67	12.70
481-500	126	490.23	5.45	19.60	71	491.48	5.94	14.06	197	490.68	5.65	17.13
501-520	111	509.79	5.67	17.26	88	511.13	6.12	17.43	199	510.38	5.90	17.30
521-540	58	529.47	5.78	9.02	74	530.18	6.43	14.65	133	529.94	6.18	11.57
541-560	24	548.75	6.42	3.73	36	549.94	6.34	7.13	60	549.47	6.35	5.22
561-580	18	571.06	6.64	2.80	24	569.50	4.93	4.75	42	570.17	5.70	3.65
581-600	8	587.50	4.14	1.24	13	590.62	6.23	2.57	21	589.43	5.63	1.83
601-620	3	604.33	0.58	0.47	5	611.80	4.66	0.99	8	609.00	5.24	0.70
621-640	3	628.00	3.46	0.47	3	626.00	5.57	0.59	6	627.00	4.29	0.52
641-660					2	654.00	2.83	0.40	2	654.00	2.83	0.17
661-680					2	669.50	6.36	0.40	2	669.50	6.36	0.17
681-700	3	693.33	8.08	0.47	5	687.20	6.38	0.99	8	689.50	7.21	0.70
701-720					2	703.00	2.83	0.40	2	703.00	2.83	0.17
801-820					2	807.00	4.24	0.40	2	807.00	4.24	0.17
901-Max					2	971.50	19.09	0.40	1	971.50	19.09	0.17
Total	643				505				1150			
Mean		482.51	50.81			500.39	69.07			490.30	60.25	
Min		305.00				350.00				305.00		
Max		698.00				985.00				985.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Crooked Creek						Species NORTHERN PIKE						
321-340	2	327.00	7.07	0.44	1	340.00		0.16	3	331.33	9.02	0.27
341-360	4	350.25	5.25	0.87					4	350.25	5.25	0.36
361-380	11	372.27	4.50	2.40	4	370.75	9.07	0.62	15	371.87	5.71	1.35
381-400	16	392.69	7.11	3.49	6	392.67	5.01	0.93	23	392.17	6.79	2.06
401-420	24	412.75	5.91	5.23	22	410.82	5.90	3.42	47	411.68	5.94	4.22
421-440	48	431.52	6.05	10.46	27	430.78	5.44	4.19	76	431.20	5.79	6.82
441-460	58	452.10	5.93	12.64	36	453.94	6.04	5.59	94	452.81	6.01	8.43
461-480	106	471.28	5.50	23.09	58	472.05	5.45	9.01	166	471.48	5.51	14.89
481-500	90	490.38	5.67	19.61	121	492.49	5.89	18.79	211	491.59	5.88	18.92
501-520	53	509.72	5.85	11.55	145	511.61	5.73	22.52	199	511.07	5.82	17.85
521-540	31	530.32	5.42	6.75	100	529.51	6.02	15.53	135	529.85	5.96	12.11
541-560	10	551.40	5.08	2.18	69	550.45	6.29	10.71	80	550.46	6.17	7.17
561-580	2	563.50	2.12	0.44	35	570.17	5.43	5.43	38	570.03	5.59	3.41
581-600	1	583.00		0.22	6	584.83	2.79	0.93	7	584.57	2.64	0.63
601-620	1	601.00		0.22	6	613.50	5.36	0.93	7	611.71	6.80	0.63
621-640	1	640.00		0.22	1	624.00		0.16	2	632.00	11.31	0.18
641-660					1	642.00		0.16	1	642.00		0.09
661-680	1	670.00		0.22	1	662.00		0.16	2	666.00	5.66	0.18
681-700					2	685.00	4.24	0.31	2	685.00	4.24	0.18
701-720					1	713.00		0.16	1	713.00		0.09
841-860					1	847.00		0.16	1	847.00		0.09
901-Max					1	935.00		0.16	1	935.00		0.09
Total	459				644				1115			
Mean		470.49	44.29			506.54	50.63			491.55	51.36	
Min		322.00				340.00				322.00		
Max		670.00				935.00				935.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Wilson River					Species NORTHERN PIKE							
241-260									1	260.00		0.08
261-280					2	277.00	2.83	0.35	2	277.00	2.83	0.16
281-300	2	295.50	6.36	0.31					2	295.50	6.36	0.16
321-340					2	339.00	1.41	0.35	2	339.00	1.41	0.16
341-360	2	356.00	5.66	0.31	2	356.50	0.71	0.35	4	356.25	3.30	0.33
361-380	12	374.67	5.93	1.83	4	368.25	7.27	0.71	16	373.06	6.68	1.31
381-400	30	394.17	5.86	4.59	8	394.50	5.29	1.42	38	394.24	5.68	3.11
401-420	40	412.40	5.63	6.12	33	411.85	5.73	5.85	73	412.15	5.64	5.97
421-440	41	431.46	5.75	6.27	43	431.09	5.64	7.62	84	431.27	5.66	6.87
441-460	79	452.32	5.39	12.08	42	452.31	5.82	7.45	123	452.20	5.57	10.07
461-480	116	471.83	5.46	17.74	46	471.13	5.09	8.16	162	471.63	5.35	13.26
481-500	127	491.73	5.73	19.42	76	491.12	5.69	13.48	203	491.50	5.71	16.61
501-520	107	510.38	5.61	16.36	90	510.22	6.32	15.96	197	510.31	5.93	16.12
521-540	48	532.75	5.56	7.34	71	531.06	5.87	12.59	119	531.74	5.78	9.74
541-560	26	548.88	5.95	3.98	50	550.68	6.15	8.87	76	550.07	6.10	6.22
561-580	8	569.50	6.87	1.22	32	571.13	6.22	5.67	41	570.66	6.28	3.36
581-600	10	585.50	4.38	1.53	17	591.88	5.50	3.01	27	589.52	5.92	2.21
601-620	1	610.00		0.15	9	609.56	6.86	1.60	10	609.60	6.47	0.82
621-640	2	630.00		0.31	5	630.60	8.20	0.89	7	630.43	6.70	0.57
641-660	1	650.00		0.15	6	652.67	3.67	1.06	7	652.29	3.50	0.57
661-680					4	670.75	5.62	0.71	4	670.75	5.62	0.33
681-700					3	688.67	2.31	0.53	3	688.67	2.31	0.25
721-740					1	724.00		0.18	1	724.00		0.08
761-780	1	763.00		0.15	1	768.00		0.18	2	765.50	3.54	0.16
781-800					1	798.00		0.18	1	798.00		0.08
821-840					3	832.67	4.04	0.53	3	832.67	4.04	0.25
841-860					2	843.50	2.12	0.35	2	843.50	2.12	0.16
861-880					4	876.00	3.74	0.71	4	876.00	3.74	0.33
881-900					1	895.00		0.18	1	895.00		0.08
901-Max	1	990.00		0.15	6	946.83	32.66	1.06	7	953.00	33.99	0.57
Total	654				564				1222			
Mean		479.91	52.51			514.38	90.65			495.61	74.90	
Min		291.00				275.00				260.00		
Max		990.00				1000.00				1000.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Mink Creek					**Species NORTHERN PIKE**							
241-260									1	250.00		0.33
341-360	1	351.00		0.64					1	351.00		0.33
361-380	5	369.20	3.96	3.21	1	380.00		0.68	6	371.00	5.66	1.97
381-400	17	391.47	6.33	10.90	5	390.60	6.35	3.42	22	391.27	6.19	7.24
401-420	8	414.13	6.06	5.13	7	410.00	6.58	4.79	15	412.20	6.44	4.93
421-440	16	429.25	5.29	10.26	17	432.06	5.45	11.64	33	430.70	5.47	10.86
441-460	25	451.76	5.52	16.03	21	452.19	6.32	14.38	46	451.96	5.84	15.13
461-480	28	470.75	5.34	17.95	24	473.58	5.04	16.44	52	472.06	5.35	17.11
481-500	33	491.45	6.41	21.15	18	490.89	5.30	12.33	52	491.08	6.07	17.11
501-520	16	510.13	5.67	10.26	24	510.42	5.20	16.44	40	510.30	5.32	13.16
521-540	5	530.20	5.40	3.21	11	528.73	7.62	7.53	16	529.19	6.85	5.26
541-560	1	553.00		0.64	9	548.78	6.26	6.16	10	549.20	6.05	3.29
561-580	1	569.00		0.64	4	567.75	8.73	2.74	5	568.00	7.58	1.64
581-600					3	588.33	5.13	2.05	3	588.33	5.13	0.99
601-620					1	605.00		0.68	1	605.00		0.33
741-760					1	750.00		0.68	1	750.00		0.33
Total	156				146				304			
Mean		459.37	43.45			483.85	51.90			470.51	50.65	
Min		351.00				380.00				250.00		
Max		569.00				750.00				750.00		
Stream Ochre River					**Species YELLOW PERCH**							
121-140	1	128.00		25.00					1	128.00		25.00
141-160	1	142.00		25.00					1	142.00		25.00
161-180	2	175.00	5.66	50.00					2	175.00	5.66	50.00
Total	4								4			
Mean		155.00	24.01							155.00	24.01	
Min		128.00								128.00		
Max		179.00								179.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

	length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
		N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream	Turtle River					Species YELLOW PERCH							
	141-160									1	142.00		25.00
	161-180	1	180.00		50.00	1	164.00		100.00	2	172.00	11.31	50.00
	181-200	1	186.00		50.00					1	186.00		25.00
	Total	2				1				4			
	Mean		183.00	4.24			164.00				168.00	19.66	
	Min		180.00				164.00				142.00		
	Max		186.00				164.00				186.00		
Stream	Edwards Creek					Species YELLOW PERCH							
	181-200	1	195.00		100.00					1	195.00		100.00
	Total	1								1			
	Mean		195.00								195.00		
	Min		195.00								195.00		
	Max		195.00								195.00		
Stream	Vermilion River					Species YELLOW PERCH							
	161-180					2	165.50	0.71	50.00	2	165.00	0.71	50.00
	181-200					1	185.00		25.00	1	185.00		25.00
	201-220					1	213.00		25.00	1	213.00		25.00
	Total					4				4			
	Mean						182.25	22.47			185.25	22.47	
	Min						165.00				165.00		
	Max						213.00				213.00		
Stream	Crooked Creek					Species YELLOW PERCH							
	161-180	1	171.00		100.00	1			100.00	2	171.00		100.00
	Total	1				1				2			
	Mean		171.00				171.00				171.00		
	Min		171.00				171.00				171.00		
	Max		171.00				171.00				171.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Wilson River					**Species YELLOW PERCH**							
161-180	3	167.33	7.09	100.00					4	169.50	7.23	80.00
181-200									1	182.00		20.00
Total	3								5			
Mean		167.33	7.09							172.00	8.40	
Min		161.00								161.00		
Max		175.00								182.00		
Stream Turtle River					**Species CARP**							
561-580	1	574.00		8.33					1	574.00		5.00
581-600	1	590.00		8.33	1	582.00		25.00	2	586.00	5.66	10.00
601-620	2	616.50	2.12	16.67					2	616.50	2.12	10.00
621-640	1	636.00		8.33					3	628.00	7.21	15.00
641-660	4	650.25	6.65	33.33					4	650.25	6.65	20.00
661-680	2	666.00	4.24	16.67					3	670.67	8.62	15.00
681-700	1	697.00		8.33	1	686.00		25.00	3	692.67	5.86	15.00
741-760					2	743.00	2.83	50.00	2	743.00	2.83	10.00
Total	12				4				20			
Mean		638.58	34.55			688.50	75.93			652.00	47.09	
Min		574.00				582.00				574.00		
Max		697.00				745.00				745.00		
Stream Wilson River					**Species CARP**							
561-580					1	573.00		100.00	1	573.00		50.00
581-600	1	588.00		100.00					1	588.00		50.00
Total	1				1				2			
Mean		588.00				573.00				580.50	10.61	
Min		588.00				573.00				573.00		
Max		588.00				573.00				588.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

	length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
		N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream	Vermilion River					Species CARP							
	481-500									1	493.00		12.50
	521-540	1	540.00		16.67					1	540.00		12.50
	541-560	1	558.00		16.67					1	558.00		12.50
	561-580	1	565.00		16.67					1	565.00		12.50
	581-600	1	595.00		16.67					1	595.00		12.50
	621-640	1	639.00		16.67					1	639.00		12.50
	661-680	1	664.00		16.67					1	664.00		12.50
	701-720					1	704.00		100.00	1	704.00		12.50
	Total	6				1				8			
	Mean		593.50	48.94			704.00				594.75	69.97	
	Min		540.00				704.00				493.00		
	Max		664.00				704.00				704.00		
Stream	Ochre River					Species SILVER REDHORSE							
	441-460	2	453.00	4.24	50.00					2	453.00	4.24	40.00
	461-480	2	468.00	2.83	50.00	1	476.00		100.00	3	470.67	5.03	60.00
	Total	4				1				5			
	Mean		460.50	9.15			476.00				463.60	10.53	
	Min		450.00				476.00				450.00		
	Max		470.00				476.00				476.00		
Stream	Wilson River					Species SILVER REDHORSE							
	441-460					1	456.00		50.00	1	456.00		50.00
	501-520					1	507.00		50.00	1	507.00		50.00
	Total					2				2			
	Mean						481.50	36.06			481.50	36.06	
	Min						456.00				456.00		
	Max						507.00				507.00		
Stream	Turtle River					Species GOLDEYE							
	301-320									1	305.00		100.00
	Total									1			
	Mean										305.00		
	Min										305.00		
	Max										305.00		

Appendix 2. Con't. Length-frequency distributions for all species and all streams.

	length Interval (mm)	Males Length (MM)				Females Length (MM)				Combined Length (MM)			
		N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream	Ochre River					Species GOLDEYE							
	281-300	1	282.00		100.00					1	282.00		100.00
	Total	1								1			
	Mean		282.00								282.00		
	Min		282.00								282.00		
	Max		282.00								282.00		
Stream	Edwards Creek					Species BURBOT							
	421-440					1	434.00		100.00	1	434.00		100.00
	Total					1				1			
	Mean						434.00				434.00		
	Min						434.00				434.00		
	Max						434.00				434.00		
Stream	Vermilion					Species BURBOT							
	601-620									1	605.00		100.00
	Total									1			
	Mean										605.00		
	Min										605.00		
	Max										605.00		
Stream	Ochre River					Species SAUGER							
	401-420					1	407.00		100.00	1	407.00		100.00
	Total					1				1			
	Mean						407.00				407.00		
	Min						407.00				407.00		
	Max						407.00				407.00		

Appendix 3. Age-frequency distribution and mean length at age for all species and all streams.

	Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
		N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Ochre River						SPECIES WALLEYE							
	4	8	416.63	32.75	38.10					13	411.00	34.65	22.03
	5	5	402.60	13.56	23.81					12	394.50	19.32	20.34
	6	1	392.00		4.76					7	456.00	46.12	11.86
	7	4	481.00	12.14	19.05	1	538.00		25.00	9	481.89	31.43	15.25
	8					3	508.67	18.34	75.00	6	482.67	33.45	10.17
	9	1	502.00		4.76					4	485.50	24.24	6.78
	10	2	516.50	17.68	9.52					2	516.50	17.68	3.39
	11									2	535.90	21.21	3.39
	12									1	520.00		1.69
	14									2	556.00	50.91	3.39
	22									1	630.00		1.69
	Total	21				4				59			
	Mean		437.95	47.36			516.00	20.96			454.39	60.09	
	Min		380.00				488.00				358.00		
	Max		529.00				538.00				630.00		
Stream Wilson River						SPECIES WALLEYE							
	4	3	407.00	6.24	100.00					3	407.00	6.24	100.00
	Total	3								3			
	Mean		407.00	6.24							407.00	6.24	
	Min		402.00								402.00		
	Max		414.00								414.00		
Stream Crooked Creek						SPECIES WALLEYE							
	4	4	403.75	14.75	40.00					4	403.75	14.75	33.33
	5	2	406.00	8.49	20.00	1	492.00		50.00	3	434.67	50.01	25.00
	6	1	507.00		10.00	1	508.00		50.00	2	507.50	0.71	16.67
	7	1	491.00		10.00					1	491.00		8.33
	8	1	514.00		10.00					1	514.00		8.33
	12	1	523.00		10.00					1	523.00		8.33
	Total	10				2				12			
	Mean		446.20	55.14			500.00	11.31			455.17	54.20	
	Min		386.00				492.00				386.00		
	Max		523.00				508.00				523.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Vermilion River						SPECIES WALLEYE						
4	1	380.00		100.00					1	380.00		100.00
Total	1								1			
Mean		380.00								380.00		
Min		380.00								380.00		
Max		380.00								380.00		
Stream Mink River						SPECIES WALLEYE						
4	1	406.00		50.00					1	406.00		25.00
5	1	438.00		50.00					1	438.00		25.00
8					2	552.50	10.61	100.00	2	552.50	10.61	50.00
Total	2				2				4			
Mean		422.00	22.63			552.50	10.61			487.25	76.71	
Min		406.00				545.00				406.00		
Max		438.00				560.00				560.00		
Stream Turtle River						SPECIES WALLEYE						
3	1	412.00		50.00					1	412.00		50.00
8	1	552.00		50.00					1	552.00		50.00
Total	2								2			
Mean		482.00	98.99							482.00	98.99	
Min		412.00								412.00		
Max		552.00								552.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Edwards Creek					**Species Quillback**							
5	1	294.00		3.13					1	294.00		1.20
7					1	387.00		1.96	1	387.00		1.20
9	5	391.80	11.12	15.63	3	409.00	21.70	5.88	8	398.25	16.87	9.64
10	4	398.75	22.11	12.50	9	425.33	26.91	17.65	13	417.15	27.72	15.66
11	4	395.25	21.64	12.50	10	441.20	28.77	19.61	14	428.07	33.84	16.87
12	6	388.50	19.06	18.75	13	429.31	23.89	25.49	19	416.42	29.35	22.89
13	4	393.00	11.17	12.50	7	419.14	30.85	13.73	11	409.64	27.97	13.25
14	7	417.57	31.02	21.88	4	435.75	19.00	7.84	11	424.18	27.74	13.25
15	1	371.00		3.13	1	435.00		1.96	2	403.00	45.25	2.41
16					2	450.50	26.16	3.92	2	450.50	26.16	2.41
19					1	527.00		1.96	1	527.00		1.20
Total	32				51				83			
Mean		394.56	28.98			430.88	29.78			416.88	34.27	
Min		294.00				374.00				294.00		
Max		466.00				527.00				527.00		
Stream Turtle River					**Species Quillback**							
11									2	425.00	22.63	50.00
12	1	407.00		100.00					2	420.00	18.38	50.00
Total	1								4			
Mean		407.00								422.50	17.08	
Min		407.00								407.00		
Max		407.00								441.00		
Stream Vermilion River					**Species Quillback**							
8					1	429.00		1.25	1	429.00		0.93
9	1	413.00		3.57	7	405.57	21.00	8.75	8	406.50	19.62	7.41
10	4	401.25	16.52	14.29	17	428.35	17.94	21.25	21	423.19	20.43	19.44
11	7	407.43	10.56	25.00	19	428.32	28.04	23.75	26	422.69	26.12	24.07
12	4	394.25	22.60	14.29	14	437.79	26.94	17.50	18	428.11	31.50	16.67
13	3	403.67	22.50	10.71	10	429.80	78.96	12.50	13	423.77	69.92	12.04
14	4	406.50	16.34	14.29	4	448.25	39.98	5.00	8	427.38	36.02	7.41
15	2	394.00	8.49	7.14	3	463.67	59.53	3.75	5	435.80	56.98	4.63
16	3	398.33	16.80	10.71	4	483.50	36.96	5.00	7	447.00	53.38	6.48
19					1	452.00		1.25	1	452.00		0.93
Total	28				80				108			
Mean		402.39	15.22			433.56	39.66			425.48	37.52	
Min		366.00				225.00				225.00		
Max		430.00				532.00				532.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

Age (yr)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Wilson River					Species Quillback							
7	3	406.67	50.54	6.98					3	406.67	50.54	4.55
8					2	426.00	8.49	8.70	2	426.00	8.49	3.03
9	6	394.33	12.79	13.95	7	433.43	22.68	30.43	13	415.38	27.14	19.70
10	13	402.15	33.66	30.23	7	440.43	34.56	30.43	20	415.55	37.99	30.30
11	7	407.71	26.11	16.28	2	465.50	24.75	8.70	9	420.56	35.17	13.64
12	8	412.25	17.39	18.60	4	456.25	35.85	17.39	12	426.92	31.82	18.18
13	3	424.00	52.89	6.98	1	445.00		4.35	4	429.25	44.44	6.06
14	2	410.00	43.84	4.65					2	410.00	43.84	3.03
15	1	473.00		2.33					1	473.00		1.52
Total	43				23				66			
Mean		407.70	30.84			442.17	28.41			419.71	34.09	
Min		336.00				396.00				336.00		
Max		485.00				514.00				514.00		
Stream Ochre River					Species Quillback							
3					1	423.00		2.17	1	423.00		0.91
4	1	290.00		1.72					1	290.00		0.91
6	1	317.00		1.72					1	317.00		0.91
7	3	371.67	30.62	5.17	2	400.00	15.56	4.35	6	380.17	25.77	5.45
8	2	379.50	4.95	3.45	5	409.60	12.34	10.87	7	401.00	17.93	6.36
9	6	386.33	16.91	10.34	4	433.00	62.19	8.70	11	407.45	43.50	10.00
10	10	402.30	19.84	17.24	8	438.25	37.90	17.39	19	417.50	33.08	17.27
11	11	406.73	23.02	18.97	8	433.88	28.74	17.39	20	417.50	27.78	18.18
12	9	413.00	34.34	15.52	6	442.00	47.27	13.04	16	421.81	41.23	14.55
13	8	400.50	21.35	13.79	7	435.29	33.51	15.22	15	416.73	32.13	13.64
14	5	400.60	28.98	8.62	3	483.67	28.02	6.52	9	432.44	47.31	8.18
15					2	526.50	2.12	4.35	2	526.50	2.12	1.82
16	2	421.00	43.84	3.45					2	421.00	43.84	1.82
Total	58				46				110			
Mean		397.62	31.36			438.76	41.42			415.14	40.81	
Min		290.00				374.00				290.00		
Max		460.00				528.00				528.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Ochre River					**Species SHORTHEAD REDHORSE**							
6					1	319.00		3.45	1	319.00		1.18
7	11	340.82	16.36	23.91	10	354.10	18.06	34.48	24	346.71	18.19	28.24
8	13	346.69	13.48	28.26	5	358.80	11.76	17.24	22	349.27	13.87	25.88
9	15	354.07	14.29	32.61	6	382.00	18.81	20.69	23	362.74	19.33	27.06
10	2	367.50	34.65	4.35	6	387.83	22.60	20.69	8	382.75	25.00	9.41
11	2	369.50	10.61	4.35					2	369.50	10.61	2.35
12	1	403.00		2.17					2	385.50	24.75	2.35
13	1	396.00		2.17	1	428.00		3.45	2	412.00	22.63	2.35
15	1	380.00		2.17					1	380.00		1.18
Total	46				29				85			
Mean		352.61	19.57			369.00	26.51			358.15	23.21	
Min		320.00				318.00				318.00		
Max		403.00				428.00				428.00		
Stream Vermilion River					**Species SHORTHEAD REDHORSE**							
7					2	348.50	10.61	66.67	2	348.50	10.61	66.67
11					1	407.00		33.33	1	407.00		33.33
Total					3				3			
Mean						368.00	34.60			368.00	34.60	
Min						341.00				341.00		
Max						407.00				407.00		
Stream Wilson River					**Species SHORTHEAD REDHORSE**							
6					1	345.00		4.00	1	345.00		2.50
7	5	333.00	6.44	33.33	9	344.78	14.19	36.00	14	340.57	13.08	35.00
8	7	370.57	18.69	46.67	8	363.25	24.98	32.00	15	366.67	21.82	37.50
9					3	415.67	47.16	12.00	3	415.67	47.16	7.50
10	2	380.50	3.54	13.33	4	410.25	26.64	16.00	6	400.33	25.77	15.00
11	1	332.00		6.67					1	332.00		2.50
Total	15				25				40			
Mean		356.80	24.16			369.68	36.52			364.85	32.71	
Min		327.00				330.00				327.00		
Max		398.00				454.00				454.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

	Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
		N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Edwards Creek						Species SHORTHEAD REDHORSE							
	8	1	335.00		33.33					1	335.00		25.00
	9	2	364.00	1.41	66.67					2	364.00	1.41	50.00
	10					1	355.00		100.00	1	355.00		25.00
	Total	3				1				4			
	Mean		354.33				355.00				354.50	13.70	
	Min		335.00				355.00				335.00		
	Max		365.00				355.00				365.00		
Stream Turtle River						Species SHORTHEAD REDHORSE							
	7	1	328.00		50.00					1	328.00		12.50
	8					3	374.67	8.74	60.00	4	372.25	8.62	50.00
	9					2	380.00	65.05	40.00	2	380.00	65.05	25.00
	12	1	416.00		50.00					1	416.00		12.50
	Total	2				5				8			
	Mean		372.00	62.23			376.80	33.24			374.13	34.68	
	Min		328.00				334.00				328.00		
	Max		416.00				426.00				426.00		
Stream Mink Creek						Species SHORTHEAD REDHORSE							
	6					1	330.00		50.00	2	316.50	19.09	40.00
	7					1	377.00		50.00	2	358.50	26.16	40.00
	8									1	345.00		20.00
	Total					2				5			
	Mean						353.50	33.23			339.00	26.73	
	Min						330.00				303.00		
	Max						377.00				377.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Turtle River					**Species WHITE SUCKER**							
5	1	350.00		5.56	1	446.00		1.82	2	398.00	67.88	2.74
6	8	387.63	23.89	44.44	14	426.21	19.94	25.45	22	412.18	28.24	30.14
7	3	385.67	16.01	16.67	20	425.85	25.84	36.36	23	420.61	28.13	31.51
8	2	410.50	12.02	11.11	4	429.25	13.40	7.27	6	423.00	15.18	8.22
9	1	383.00		5.56	6	442.67	18.95	10.91	7	434.14	28.42	9.59
10	3	392.33	15.01	16.67	2	426.00	29.70	3.64	5	405.80	25.95	6.85
11					5	449.40	12.54	9.09	5	449.40	12.54	6.85
12					1	442.00		1.82	1	442.00		1.37
13					1	450.00		1.82	1	450.00		1.37
16					1	447.00		1.82	1	447.00		1.37
Total	18				55				73			
Mean		388.28	21.22			431.65	21.97			420.96	28.68	
Min		350.00				376.00				350.00		
Max		425.00				478.00				478.00		
Stream Edwards Creek					**Species WHITE SUCKER**							
4					1	364.00		2.13	1	364.00		1.33
5	1	335.00		3.57					1	335.00		1.33
6	3	434.33	52.50	10.71	2	430.00	39.60	4.26	5	432.60	42.14	6.67
7	6	385.67	20.40	21.43	8	419.13	21.56	17.02	14	404.79	26.56	18.67
8	5	399.20	27.07	17.86	9	412.78	13.99	19.15	14	407.93	19.79	18.67
9	3	404.00	8.89	10.71	6	429.00	26.37	12.77	9	420.67	24.71	12.00
10	6	401.67	12.93	21.43	8	430.50	20.16	17.02	14	418.14	22.41	18.67
11	1	406.00		3.57	6	431.50	32.73	12.77	7	427.86	31.40	9.33
12	2	429.00	16.97	7.14	5	435.00	12.97	10.64	7	433.71	13.06	9.33
13	1	405.00		3.57					1	405.00		1.33
14					1	432.00		2.13	1	432.00		1.33
15					1	464.00		2.13	1	464.00		1.33
Total	28				47				75			
Mean		401.39	28.90			424.96	24.16			416.16	28.27	
Min		335.00				364.00				335.00		
Max		487.00				464.00				487.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Vermilion River					**Species WHITE SUCKER**							
4	2	361.50	9.19	15.38					2	361.50	9.19	4.17
5					1	389.00		2.86	1	389.00		2.08
6	2	405.50	12.02	15.38	11	443.27	19.94	31.43	13	437.46	23.34	27.08
7	5	406.80	11.50	38.46	12	438.92	18.03	34.29	17	429.47	22.00	35.42
8					2	456.50	16.26	5.71	2	456.50	16.26	4.17
9	2	416.50	2.12	15.38	4	452.00	24.54	11.43	6	440.17	26.42	12.50
10	1	420.00		7.69	2	430.00	14.14	5.71	3	426.67	11.55	6.25
11	1	428.00		7.69	2	468.00	25.46	5.71	3	454.67	29.28	6.25
12					1	445.00		2.86	1	445.00		2.08
Total	13				35				48			
Mean		403.77	21.53			442.69	21.60			432.15	27.59	
Min		355.00				389.00				355.00		
Max		428.00				486.00				486.00		
Stream Wilson River					**Species WHITE SUCKER**							
4	1	330.00		2.94					1	330.00		0.99
6	5	396.80	11.10	14.71	6	438.83	30.39	8.96	11	419.73	31.51	10.89
7	7	394.14	14.18	20.59	8	431.38	22.02	11.94	15	414.00	26.43	14.85
8	5	403.20	11.92	14.71	11	439.73	26.91	16.42	16	428.31	28.75	15.84
9	7	430.00	30.56	20.59	16	448.44	24.15	23.88	23	442.83	26.97	22.77
10	1	420.00		2.94	14	451.29	15.98	20.90	15	449.20	17.39	14.85
11	2	425.50	14.85	5.88	7	457.57	24.35	10.45	9	450.44	25.93	8.91
12	3	430.00	41.90	8.82	3	458.67	10.69	4.48	6	444.33	31.54	5.94
13	1	427.00		2.94					1	427.00		0.99
14	2	451.50	9.19	5.88	2	477.50	31.82	2.99	4	464.50	24.31	3.96
Total	34				67				101			
Mean		411.47	29.74			446.99	24.12			435.03	30.99	
Min		330.00				368.00				330.00		
Max		484.00				500.00				500.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

	Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
		N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Ochre River						Species WHITE SUCKER							
	4									1	360.00		0.85
	5	1	399.00		1.89	1	380.00		1.64	2	389.50	13.44	1.69
	6	6	401.33	20.39	11.32	4	428.75	29.50	6.56	10	412.30	28.86	8.47
	7	11	392.55	16.78	20.75	9	423.67	30.41	14.75	21	407.19	27.55	17.80
	8	6	392.00	35.40	11.32	13	424.23	27.65	21.31	19	414.05	33.09	16.10
	9	6	424.50	34.13	11.32	8	434.38	8.96	13.11	14	430.14	22.74	11.86
	10	5	394.60	11.55	9.43	10	442.10	13.60	16.39	17	426.06	25.05	14.41
	11	9	405.44	12.85	16.98	6	435.33	13.13	9.84	15	417.40	19.64	12.71
	12	5	427.20	16.93	9.43	6	451.83	10.50	9.84	11	440.64	18.31	9.32
	13	2	418.50	0.71	3.77	2	435.00	1.41	3.28	4	426.75	9.57	3.39
	14	1	443.00		1.89	2	485.00	21.21	3.28	3	453.00	17.32	2.54
	15	1	393.00		1.89					1	393.00		0.85
	Total	53				61				118			
	Mean		404.81	24.04			433.25	23.17			419.59	27.60	
	Min		336.00				380.00				336.00		
	Max		469.00				490.00				490.00		
Stream Crooked Creek						Species WHITE SUCKER							
	3	1	335.00		3.45					1	335.00		1.45
	4	1	340.00		3.45					1	340.00		1.45
	5					1	377.00		2.50	1	377.00		1.45
	6	3	419.33	59.21	10.34					3	419.33	59.21	4.35
	7	4	370.75	2.50	13.79	4	407.75	26.65	10.00	8	389.25	26.42	11.59
	8	3	394.00	14.73	10.34	4	454.50	19.87	10.00	7	428.57	36.27	10.14
	9	3	388.00	13.00	10.34	3	430.67	9.02	7.50	6	409.33	25.42	8.70
	10	4	397.00	10.49	13.79	4	452.50	9.81	10.00	8	424.75	31.12	11.59
	11	4	416.25	9.43	13.79	7	462.71	23.39	17.50	11	445.82	30.07	15.94
	12	3	400.33	11.85	10.34	5	456.20	13.99	12.50	8	435.25	31.43	11.59
	13	1	415.00		3.45	9	445.33	18.68	22.50	10	442.30	20.06	14.49
	14	1	420.00		3.45	3	450.00	28.21	7.50	4	442.50	27.49	5.80
	17	1	414.00		3.45					1	414.00		1.45
	Total	29				40				69			
	Mean		395.34	28.58			445.15	26.06			424.22	36.60	
	Min		335.00				377.00				335.00		
	Max		487.00				490.00				490.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Mink Creek					**Species WHITE SUCKER**							
5	1	362.00		1.35					1	362.00		0.63
6	2	385.00	5.66	2.70	1	424.00		1.16	3	398.00	22.87	1.88
7	6	382.83	12.16	8.11	3	406.67	16.20	3.49	9	390.78	17.32	5.63
8	6	384.33	5.79	8.11	2	432.50	7.78	2.33	8	396.38	23.02	5.00
9	6	403.17	11.60	8.11	14	431.86	21.37	16.28	20	423.25	23.02	12.50
10	16	402.75	21.28	21.62	8	440.50	18.62	9.30	24	415.33	27.04	15.00
11	14	403.93	15.05	19.82	20	446.65	13.88	23.26	34	429.06	25.61	21.25
12	13	409.00	12.97	17.57	23	444.70	20.30	26.74	36	431.81	24.88	22.50
13	5	415.80	11.73	6.76	10	453.20	10.30	11.63	15	440.73	20.99	9.38
14	2	415.00	16.97	2.70	3	447.00	13.00	3.49	5	434.20	21.53	3.13
15					2	458.00	14.14	2.33	2	458.00	14.14	1.25
16	1	381.00		1.35					1	381.00		0.63
18	2	439.00	2.83	2.70					2	439.00	2.83	1.25
Total	74				86				160			
Mean		401.86	18.74			442.20	19.19			423.54	27.66	
Min		362.00				386.00				362.00		
Max		445.00				479.00				479.00		
Stream Mossy River					**Species WHITE SUCKER**							
5	3	376.00	15.10	4.41					3	376.00	15.10	2.88
6	7	366.86	10.17	10.29					7	366.86	10.17	6.73
7	11	371.73	14.63	16.18	6	407.33	13.62	16.67	17	384.29	22.35	16.35
8	10	385.10	14.73	14.71	4	406.50	14.15	11.11	14	391.21	17.24	13.46
9	9	389.22	9.87	13.24	4	414.50	21.30	11.11	13	397.00	18.05	12.50
10	13	392.00	16.70	19.12	11	436.00	16.71	30.56	24	412.17	27.72	23.08
11	8	403.88	43.91	11.76	6	453.17	21.89	16.67	14	425.00	43.17	13.46
12	6	415.00	9.34	8.82	4	423.75	3.30	11.11	10	418.50	8.51	9.62
13	1	411.00		1.47	1	429.00		2.78	2	420.00	12.73	1.92
Total	68				36				104			
Mean		387.75	23.48			426.86	22.54			401.29	29.68	
Min		340.00				389.00				340.00		
Max		498.00				470.00				498.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

	Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
		N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Crooked Creek						Species NORTHERN PIKE							
	4					1	546.00		2.44	1	546.00		1.33
	5	6	370.33	31.74	17.65	3	364.67	25.01	7.32	9	368.44	28.18	12.00
	6	9	423.56	26.81	26.47	4	496.75	17.17	9.76	13	446.08	42.30	17.33
	7	13	468.00	26.34	38.24	15	492.87	35.06	36.59	28	481.32	33.24	37.33
	8	4	478.25	24.94	11.76	11	545.00	43.32	26.83	15	527.20	49.07	20.00
	9	2	581.50	27.58	5.88	2	672.00	14.14	4.88	4	626.75	55.23	5.33
	10					2	593.00	19.80	4.88	2	593.00	19.80	2.67
	12					1	847.00		2.44	1	847.00		1.33
	13					1	540.00		2.44	1	540.00		1.33
	14					1	935.00		2.44	1	935.00		1.33
	Total	34				41				75			
	Mean		446.88	57.15			533.34	107.40			494.15	97.79	
	Min		322.00				340.00				322.00		
	Max		601.00				935.00				935.00		
Stream Ochre River						Species NORTHERN PIKE							
	4	1	340.00		2.94	1	395.00		2.13	2	367.50	38.89	2.20
	5	1	409.00		2.94	7	405.00	9.17	14.89	8	405.50	8.60	8.79
	6	1	417.00		2.94	1	412.00		2.13	2	414.50	3.54	2.20
	7	6	428.17	34.46	17.65	9	421.33	33.49	19.15	16	429.31	38.02	17.58
	8	10	447.10	41.31	29.41	7	498.14	34.68	14.89	21	478.52	47.06	23.08
	9	3	489.00	21.52	8.82	12	513.33	39.45	25.53	15	508.47	37.29	16.48
	10	8	498.38	34.92	23.53	3	510.00	44.03	6.38	15	506.40	37.66	16.48
	11	3	507.67	17.56	8.82	5	539.80	12.03	10.64	8	527.75	21.15	8.79
	12	1	505.00		2.94	2	662.50	53.03	4.26	4	591.25	88.64	4.40
	Total	34				47				91			
	Mean		461.41	49.56			481.60	70.09			478.42	61.79	
	Min		340.00				354.00				340.00		
	Max		565.00				700.00				700.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Wilson River					**Species NORTHERN PIKE**							
3	3	325.00	51.29	8.82					3	325.00	51.29	2.97
4	2	404.00	22.63	5.88	2	403.00	21.21	3.03	4	403.50	17.92	3.96
5	7	411.71	33.87	20.59	6	447.67	37.73	9.09	14	429.21	37.54	13.86
6	1	432.00		2.94	10	491.60	67.23	15.15	11	486.18	66.27	10.89
7	12	467.42	35.24	35.29	23	522.91	49.17	34.85	35	503.89	51.77	34.65
8	7	491.14	53.01	20.59	10	535.00	67.00	15.15	17	516.94	63.83	16.83
9	1	545.00		2.94	6	592.67	76.49	9.09	7	585.86	72.11	6.93
10	1	508.00		2.94	3	679.33	149.00	4.55	4	636.50	148.80	3.96
11					2	902.50	81.32	3.03	2	902.50	81.32	1.98
12					4	756.00	189.30	6.06	4	756.00	189.30	3.96
Total	34				66				101			
Mean		446.97	63.35			548.61	122.00			513.33	115.70	
Min		291.00				388.00				291.00		
Max		585.00				960.00				960.00		
Stream Vermilion River					**Species NORTHERN PIKE**							
3					1	431.00		2.08	1	431.00		0.97
4	2	376.00	5.66	3.64	3	378.67	26.08	6.25	5	377.60	18.72	4.85
5	4	419.00	37.97	7.27	5	387.80	27.22	10.42	9	401.67	34.37	8.74
6	10	430.40	51.15	18.18	11	478.09	54.96	22.92	21	455.38	57.30	20.39
7	16	491.38	37.78	29.09	13	497.69	36.25	27.08	29	494.21	36.58	28.16
8	11	489.73	28.84	20.00	12	542.83	37.22	25.00	23	517.43	42.50	22.33
9	10	511.50	41.64	18.18	3	565.00	45.90	6.25	13	523.85	46.93	12.62
10	2	504.50	23.33	3.64					2	504.50	23.33	1.94
Total	55				48				103			
Mean		474.64	52.27			488.42				481.06	60.04	
Min		349.00				350.00				349.00		
Max		582.00				615.00				615.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

	Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
		N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Edwards Creek						Species NORTHERN PIKE							
	3	1	374.00		1.14					1	374.00		0.62
	4	6	378.00	35.15	6.82	2	406.00	8.49	2.74	8	385.00	32.57	4.94
	5	22	377.77	20.29	25.00	10	426.50	38.58	13.70	32	393.00	35.18	19.75
	6	15	436.07	42.74	17.05	8	454.25	68.01	10.96	24	441.75	51.03	14.81
	7	23	480.78	47.31	26.14	27	508.81	53.22	36.99	50	495.92	52.03	30.86
	8	15	488.53	47.45	17.05	15	544.60	62.58	20.55	30	516.57	61.57	18.52
	9	2	548.00	19.80	2.27	9	562.56	59.43	12.33	11	559.91	53.85	6.79
	10	3	515.67	104.20	3.41	1	610.00		1.37	4	539.25	97.31	2.47
	11	1	650.00		1.14	1	917.00		1.37	2	783.50	188.80	1.23
	Total	88				73				162			
	Mean						509.70	86.39			474.12	83.32	
	Min						370.00				344.00		
	Max						917.00				917.00		
Stream Turtle River						Species NORTHERN PIKE							
	4	5	370.00	26.17	6.76	4	445.75	63.52	4.21	9	403.67	58.73	4.95
	5	13	406.77	23.13	17.57	8	442.38	28.74	8.42	22	421.45	30.13	12.09
	6	14	456.57	44.85	18.92	17	507.59	45.41	17.89	33	484.36	50.47	18.13
	7	26	488.62	38.24	35.14	33	523.24	47.38	34.74	65	505.62	45.66	35.71
	8	14	500.93	41.37	18.92	18	554.94	74.43	18.95	33	532.18	66.19	18.13
	9	2	499.00	4.24	2.70	9	571.44	41.09	9.47	14	554.64	43.77	7.69
	10					4	653.50	57.88	4.21	4	653.50	57.88	2.20
	12					2	849.50	112.40	2.11	2	849.50	112.40	1.10
	Total	74				95				182			
	Mean		462.77	54.75			533.29	82.75			502.16	77.69	
	Min		346.00				397.00				346.00		
	Max		589.00				929.00				929.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Mossy River					**Species NORTHERN PIKE**							
4	1	347.00		1.96	1	398.00		1.75	2	372.50	36.06	1.82
5	8	416.00	27.36	15.69	5	428.00	16.85	8.77	13	420.62	23.84	11.82
6	10	440.70	44.29	19.61	12	451.25	26.44	21.05	23	445.09	34.96	20.91
7	12	493.08	29.26	23.53	8	467.13	33.37	14.04	21	478.29	37.84	19.09
8	14	482.71	42.41	27.45	18	514.72	33.74	31.58	32	500.72	40.48	29.09
9	6	518.00	33.11	11.76	8	532.75	18.08	14.04	14	526.43	25.59	12.73
10					3	574.33	1.53	5.26	3	574.33	1.53	2.73
11					1	550.00		1.75	1	550.00		0.91
13					1	626.00		1.75	1	626.00		0.91
Total	51				57				110			
Mean		467.94	51.08			493.26	52.88			479.87	53.92	
Min		347.00				398.00				347.00		
Max		561.00				626.00				626.00		
Stream Mink River					**Species NORTHERN PIKE**							
4	2	372.50	12.02	4.26	1	397.00		1.64	3	380.67	16.50	2.78
5	4	410.00	19.61	8.51	6	447.50	42.01	9.84	10	432.50	38.52	9.26
6	9	435.22	25.01	19.15	7	446.71	20.32	11.48	16	440.25	23.10	14.81
7	5	452.80	15.71	10.64	16	480.38	33.89	26.23	21	473.81	32.49	19.44
8	15	470.33	24.70	31.91	18	489.22	19.24	29.51	33	480.64	23.55	30.56
9	9	471.11	19.59	19.15	11	522.27	39.30	18.03	20	499.25	40.70	18.52
10	2	505.00	7.07	4.26	2	566.00	29.70	3.28	4	535.50	39.38	3.70
11	1	515.00		2.13					1	515.00		0.93
Total	47				61				108			
Mean		455.02	35.71			484.89	42.16			471.89	42.03	
Min		364.00				385.00				364.00		
Max		515.00				587.00				587.00		
Stream Turtle River					**Species YELLOW PERCH**							
3									1	142.00		25.00
4	1	180.00		50.00	1	164.00		100.00	2	172.00	11.31	50.00
5	1	186.00		50.00					1	186.00		25.00
Total	2				1				4			
Mean		183.00	4.24			164.00				168.00	19.66	
Min		180.00				164.00				142.00		
Max		186.00				164.00				186.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Edwards Creek					**Species YELLOW PERCH**							
5	1	195.00		100.00					1	195.00		100.00
Total	1								1			
Mean		195.00								195.00		
Min		195.00								195.00		
Max		195.00								195.00		
Stream Turtle River					**Species CARP**							
9	1	618.00		10.00					1	618.00		6.25
11	1	615.00		10.00	1	582.00		33.33	2	598.50	23.33	12.50
12	2	656.00		20.00	1	686.00		33.33	5	649.20	26.10	31.25
14					1	741.00		33.33	1	741.00		6.25
15	2	640.00	5.66	20.00					2	640.00	5.66	12.50
16	1	574.00		10.00					2	627.00	74.95	12.50
17	2	680.00	24.04	20.00					2	680.00	24.04	12.50
19	1	669.00		10.00					1	669.00		6.25
Total	10				3				16			
Mean		642.80	34.24			669.67	80.75			647.81	42.78	
Min		574.00				582.00				574.00		
Max		697.00				741.00				741.00		
Stream Vermilion River					**Species CARP**							
7	1	558.00		16.67					2	525.50	45.96	25.00
8	2	552.50	17.68	33.33					2	552.50	17.68	25.00
13	1	639.00		16.67					1	639.00		12.50
16	1	664.00		16.67					1	664.00		12.50
17					1	704.00		100.00	1	704.00		12.50
18	1	595.00		16.67					1	595.00		12.50
Total	6				1				8			
Mean		593.50	48.94			704.00				594.75	69.97	
Min		540.00				704.00				493.00		
Max		664.00				704.00				704.00		

Appendix 3. Con't. Age-frequency distribution and mean length at age for all species and all streams.

Age (y)	Males Length (MM)				Females Length (MM)				Total sampled Length (MM)			
	N	MEAN	STD	%	N	MEAN	STD	%	N	MEAN	STD	%
Stream Wilson River					**Species CARP**							
8	1	588.00		100.00					1	588.00		100.00
Total	1								1			
Mean		588.00								588.00		
Min		588.00								588.00		
Max		588.00								588.00		
Stream Ochre River					**Species SILVER REDHORSE**							
8	1	450.00		25.00					1	450.00		20.00
9					1	476.00		100.00	1	476.00		20.00
11	1	470.00		25.00					1	470.00		20.00
12	2	461.00	7.07	50.00					2	461.00	7.07	40.00
Total	4				1				5			
Mean		460.50	9.15			476.00				463.60	10.53	
Min		450.00				476.00				450.00		
Max		470.00				476.00				476.00		
Stream Wilson River					**Species SILVER REDHORSE**							
8					1	456.00		50.00	1	456.00		50.00
11					1	507.00		50.00	1	507.00		50.00
Total					2				2			
Mean						481.50	36.06			481.50	36.06	
Min						456.00				456.00		
Max						507.00				507.00		
Stream Ochre River					**Species GOLDEYE**							
5	1	282.00		100.00					1	282.00		100.00
Total	1								1			
Mean		282.00								282.00		
Min		282.00								282.00		
Max		282.00								282.00		

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